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## Tempest in a Saucer

NOW it's saucers in the sky, one by one or in ordered array—here, there, everywhere—silver ones, white ones, golden ones—flashing over the horizon at supersonic speeds, streaming off to the northwest in a shimmer of incredible and malevolent luminescence.

This is Armageddon!

In this week of awful crisis, face-to-face with the Unknown, the public mood has been one of admirable restraint. But understandable nervous strain in no way has been tempered by countermeasures on the part of the political and scientific leaders to whom the public rightfully looks for protection. Rather, calls for action have been met by unimaginative calumny, and in certain official quarters by actual ribald denunciation.

Once again this shows how quick and instinctive is the public's awareness of danger. Political leaders have enmeshed themselves so thoroughly in foreign controversies as to react sluggishly to this overriding threat at home. Positive reactions on the part of scientific leaders are even slower in coming, an attitude so reprehensible as to raise doubts both as to their ability and good faith. The Emergency Committee of Atomic Scientists seems so busy promulgating the problems of atomic fission as to ignore the evidence that other scientists somewhere have conquered the outermost frontiers of nuclear physics—have so tamed the eternal and unchangeable laws ruling the fundamental energy-matter relationships as to turn this hideous instrument of destruction against the United States.

There should be an immediate Congressional inquiry, despite reluctance to extend the present session. Heads should roll, even if the investigation reaches into the highest circles.

By this time there should be evidence of some sense of urgency at Los Alamos, at Berkeley, at Princeton. Einstein certainly knows that his famous equation is a reversible equation—that matter is nothing but highly condensed energy—that matter and energy can be transformed one into the other. The atomic bomb is the actual consequence of the annihilation of matter with prodigious release of energy. Why this reluctance to recognize the converse?

The mind may reel, but it can no longer be ignored that this fair land is shuddering from the impact of radiant energy shot in bundles through space, timed in devilish fashion to stop and congeal into matter. These are the flying saucers or disks—obviously magnetic and thus responsive to the pull of the North magnetic pole—obviously moving at great speed until they diffuse into a radioactive dust blanket which gradually settles to blot out in slow insidious death still another area of this unprotected country.

What enemy could be so completely devoid of the very fundamentals of moral responsibility as to unleash such a frightful attack on a peaceful and unsuspecting people? There is an understandable tendency to impute all troubles to the Soviet Union. That dim and evil land may have some infernal contraption hidden East of the Urals (it's always East of the Urals, never West!), but there is weighty evidence to the contrary. Only a few weeks ago, Rev. Bernard Hubbard, the "glacier priest" of Alaska, returned from there to report (U.P. dispatch, June 23) that Russia's one atomic plant had blown up. He rightly pointed out that this showed just how far behind and helpless they are in atomic know-how.

The energy bundles from heaven must be streaming in from outer space. Not the Moon; perhaps Mars; probably Venus. There, creatures spawned in an abstract world of pure science, ignorant of sensory pleasures and scornful of moral values, have watched with unsympathetic contempt the five surges of atomic energy bursting in pricks of light from the earth. The great electronic machines worked out the millions of intricate calculations. Slowly the huge parabolic antenna was swung into line with diabolic cleverness. Some almost bodiless beast touched a button.

T. W. Lippett



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► Several experienced steel product managers see no letup in American steel demand until the middle of next year; there will be occasional soft spots but on the average steel will be hard to get for another year. They claim top management predictions of softening by years' end is too heavily weighted with factors other than those supporting a strong steel market. Time will tell.

► There is no sign that the bigger and more stable labor unions will take out their hatred of the Taft-Hartley bill in strikes and wildcat stoppages. The cooler heads will stick to their pledges and test the bill in the courts. It took 2 years for the Supreme Court to validate the Wagner Act; various sections of the new act may take almost as long to clarify.

► The oft looked for beehive coke oven obituary can't be written yet. On the contrary, with U. S. Steel Corp. subsidiaries in the Pittsburgh district using beehive coke for about 15 pct of their blast furnace output, there is every reason to believe beehives will be operated for a good many more years.

► A prefabricated all-aluminum house using the insulation principles of a thermos bottle is being considered for production. Estimates indicate a house for a family of four can be mass produced and sold for about \$3000.

► The British government is halting its program of converting openhearth to fuel oil just when superintendents were getting enthusiastic about their experiences with oil fired furnaces. Primary cause of the reversal is the shortage of light plate needed for storage facilities.

► Despite efforts to increase available freight cars the present car pool of all Class I railroads decreased by 5076 cars during the first 5 months of this year because cars are wearing out faster than they can be replaced. But June car output of 5514 cars set a record unequalled since May 1942.

► If the Federal Trade Commission succeeds in replacing the present basing point system with an f.o.b. mill basis many steel buyers believe that in a sellers' market the result would be an even more concentrated dose of the present practice of backyard selling. Those closest to the mills would then have an even bigger edge on steel buying.

► An important application of X-ray diffraction—identification of crystalline forms of substances—is being expanded. The new approach is to study them under high temperatures in a resistance furnace because some substances revert to normal after cooling. A Geiger counter replaces the photographic film formerly used in the spectrometer permitting a boost in the working temperature from 1800 to 2700°F.

► Study of workers' visual skills has succeeded in reducing rejects, improving production and bettering personal safety records.

► The new automatic Sonigage, an ultrasonic device that permits rapid non-destructive tests for freedom from flaws also measures thickness when only one surface of the material is available. Sections of flats and tubes between 0.005 and 0.250 in. can be read directly and those up to several inches thick can be indirectly read, both with less than a 2 pct error.

► Two private airplane builders, Fairchild and Beech, inaugurated overseas air shipment this week when one of each of their ships was put aboard a K. L. M. C-54 airfreighter at LaGuardia field for delivery to Europe. Eight more of these companies' planes will be thus flown over in the near future.

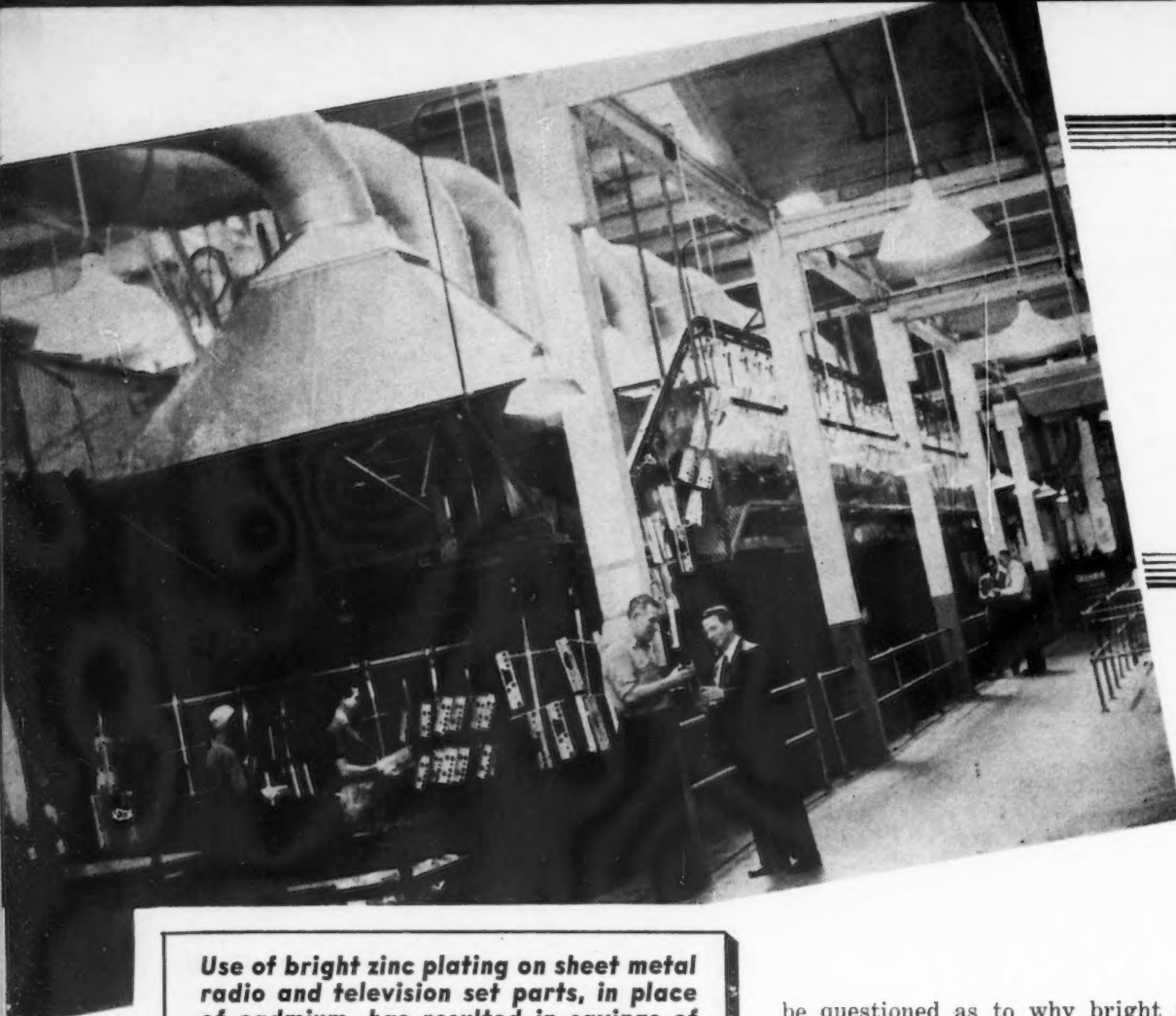
► If China, instead of seeking aid under the Marshall Plan, would put an end to tungsten smuggling and ship some here where money is owed, instead of selling it to Russia for cash, there would probably be no price increase on tungsten high speed tool steels the first of next month.

► Ford foundry engineers have devised a high frequency electric dust collecting system rated at 75,000 cfm, probably the only one of its kind in any foundry.

► With emphasis in the steel industry on increased finishing capacity for flat-rolled products the chances of extra semifinished steel being sold on the open market are getting slimmer and slimmer. This means non-integrated makers will find their source of raw material for finished flat-rolled products contracting toward zero over the next few years.



# Bright Z



**Use of bright zinc plating on sheet metal radio and television set parts, in place of cadmium, has resulted in savings of \$100,000 per year at the Philco Corp. Philadelphia plant. Equipment and procedures used by Philco in applying this finish rapidly and efficiently are described in detail in this article. The author gives a step-by-step description of the plating cycles, listing in detail the solutions, times and temperatures.**

**F**AST and extremely efficient bright zinc plating is being done on a large scale on sheet steel parts required for products made by the Philco Corp. at its Philadelphia radio and television manufacturing plants. Such plating is employed chiefly for protection against rusting and has almost supplanted cadmium plating with savings that exceed \$100,000 a year on metal costs alone.

Although, on some scores, cadmium plating is preferred, and still is used for some small parts that are barrel plated, the scarcity and high cost of cadmium would preclude its current use on so large a scale. Zinc, too, has its advantages and not the least of these are its relatively low cost and ability to be applied rapidly. Appearance is good and, even though tarnishing does occur in time, this is not a detriment since those parts that are designed for exposed locations are painted over the plating anyway.

As most of the parts plated are either hidden when in use or are painted after plating, it may

be questioned as to why bright zinc is chosen over gray zinc. The answer is that bright plating costs little if any more and looks much better. Moreover, gray zinc may be so dark in corners of parts that it is hard to tell whether the metal is covered. This is not true when the bright solution is used, as the color is light and uniform.

Actually, only those steel parts that have a smooth lustrous surface before plating come out of plating with much of a luster. Today, this percentage is low because it is necessary to use such steel as can be purchased. The higher finished stock that would be preferred is seldom available. That which must be accepted has a coarse grain, often surface defects or irregularities is rarely bright. Despite this, the plated parts have some luster and a color that is much more pleasing than if gray zinc deposits were applied.

Current practice not only requires the bright plate but calls for a bright dip after plating, and this also improves the appearance. All parts come from the plating line with a pleasing silvery color, and tarnishing is not rapid except under unusually adverse service conditions. Soldering can be done more readily and at lower temperature to cadmium plated surfaces but little is needed on the zinc plated parts (usually only a ground wire, if any) and soldering to the zinc surface here is satisfactory.

Except for bright zinc barrel plating, done only on small parts, zinc plating is confined at Philco to two parallel lines. One of these has the Meaker type of conveyor and the other a U. S. Galvanizing & Equipment Co. type. Both lines employ the same general system, sequence and solutions, but there are differences in detail.

# nt Zinc Plating Cuts

By CLARENCE W. SMITH

Chief Chemical Engineer,  
Philco Corp.,  
Philadelphia

## Costs at Philco Plant

On the Meaker line pressure spray cleaning for 81 sec is used in the first stage and there is no drying tunnel at the end. For the latter reason, this line is used chiefly for parts of heavier gage which pick up enough heat in the final hot rinse to dry in still air before unracking. This line can be used for light gage parts, but they are then dried by hot air from two forced draft Modine heaters which, though near the end of the line, are not a part of the Meaker setup.

On the U.S.G. line, the first operation is an immersion soak in a cleaner for 2 2/3 min, and the final operation is drying for 3 1/2 min in a tunnel having steam coils at the bottom. Only natural convection of the air is used, no blower being provided. Although, as table I shows, there are other minor differences in time, the total cycle

time for the Meaker line is 14 min exclusive of drying, and for the U.S.G. is 19 min including drying. All types of parts are handled, regardless of gage, through this line.

On the both lines, each carrier bar is arranged to handle five racks which are loaded as rapidly as they come from a chain conveyer to the start of the lines. In an average rack load, the parts have a total area of about 4 sq ft and the maximum area is limited to 5 sq ft in the setup used.

As there are 27 carrier bars in use at one time on the Meaker line, it can handle when fully loaded 135 racks or an average of 540 sq ft per cycle of 14 min, or about 2300 sq ft per hr. On the U.S.G. line, 36 bars are in use at a time and they can handle 180 racks or 720 sq ft per cycle of 19 min or 2300 sq ft per hr. Since both ma-

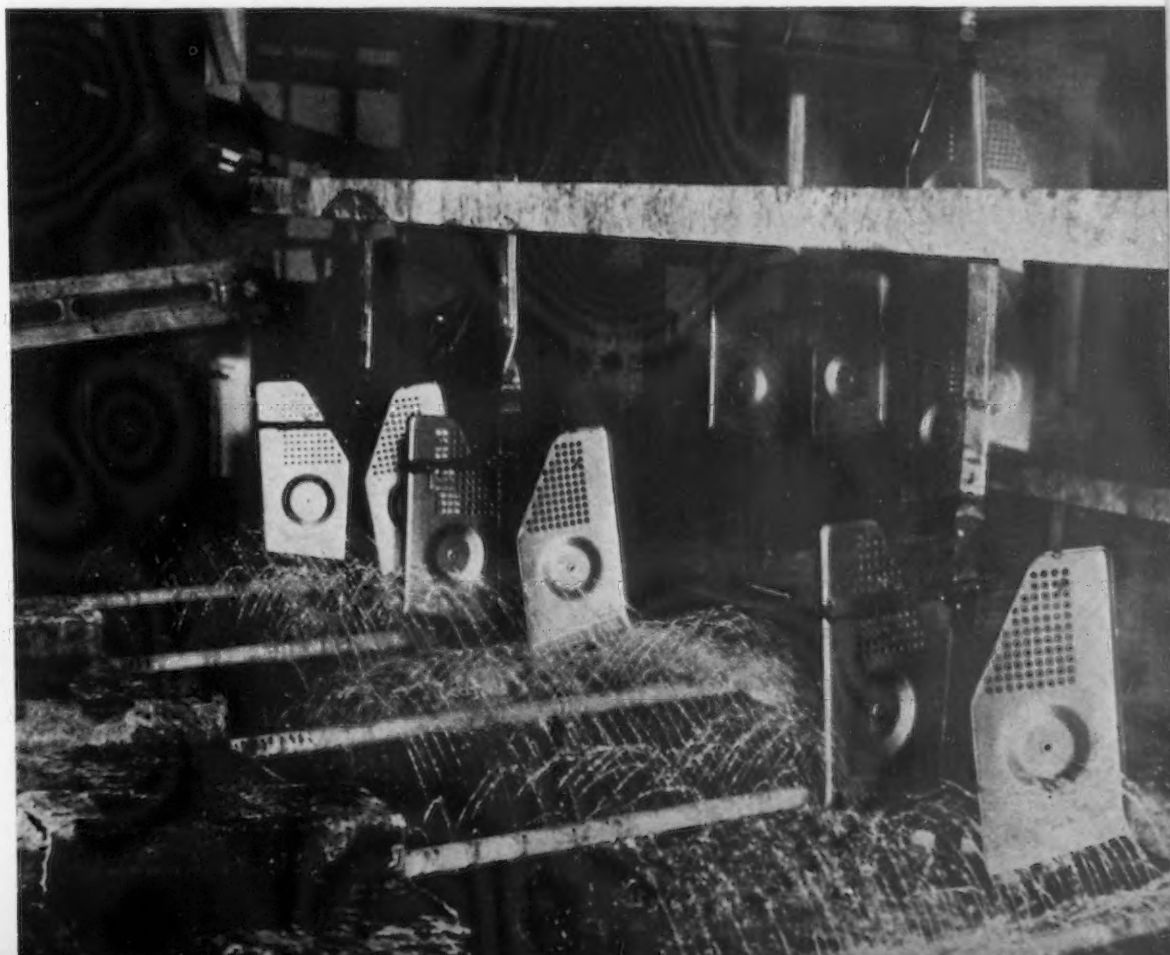
### OPPOSITE PAGE

Exit end of the Meaker bright zinc plating line. Parts that are unracked are loaded into tote boxes or, if not completely dry, are hung for a short time in a heated forced draft.

o o o

### RIGHT

Combination spray and immersion rinse that follows the acid pickle in the U.S.G. plating line.

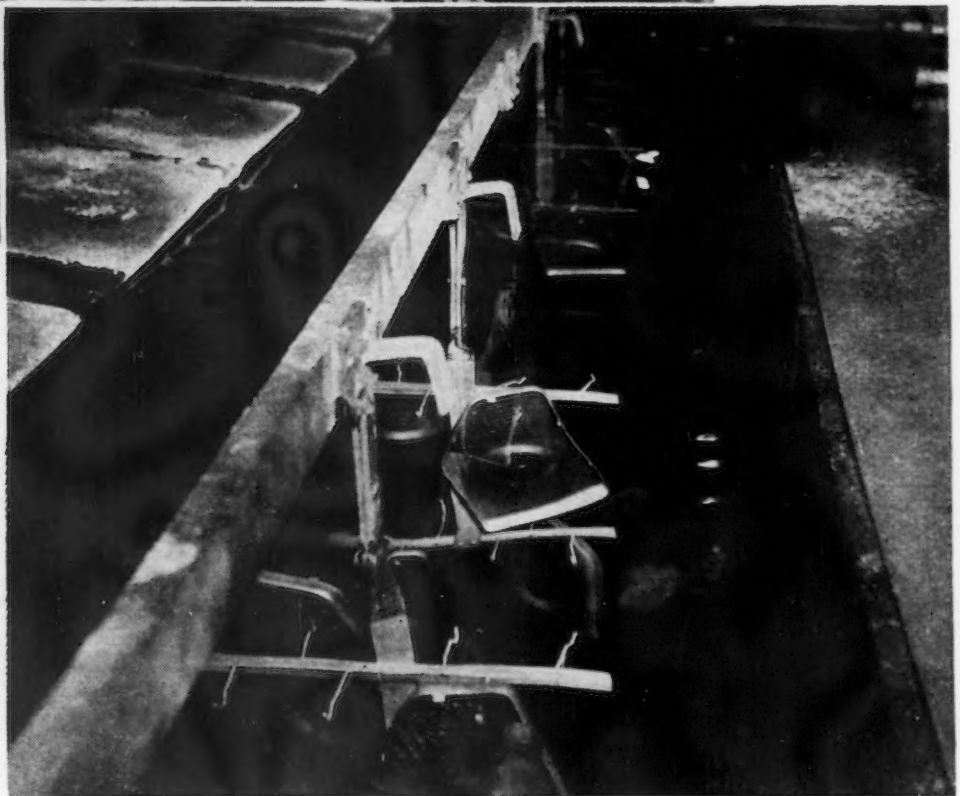






#### LEFT

View along the bright zinc plating tank of the U.S.G. line which has five lanes. On each side of each lane there is a row of anodes in bags, the anodes being du Pont Duro-brite zinc.



#### RIGHT

Acid bright dip that follows the rinses after zinc plating. Metal drain boards at left catch solution that drips off parts and racks and drain it back into the tank, preventing the acid from corroding the outside of the tank.

chines run three shifts a day, 5 days a week, although not always fully loaded, a very large volume of work can be put through.

*First Operation:* In the initial operation the following solutions are used:

		Meaker Spray	U.S.G. Soak
Caustic soda	oz. per gal.	0.3	1.5
Trisodium phosphate	oz. per gal.	0.3	2.0
Sodium metasilicate	oz. per gal.	0.8	2.0
International No. 69B	oz. per gal.	0.1	1.0

In the Meaker, the solution is held between 165° and 195°F and in the U.S.G. between 200° and 210°F. Additions of salts are made every 24 hr. The Meaker solution is renewed daily and that in the 3800-gal U.S.G. tanks is renewed each 2 weeks. As the solution in the Meaker is sprayed

under pressure, rapid circulation occurs and the solution is continuously filtered.

*Second Operation:* Electric cleaning is done with reverse current of not less than 35 amp per sq ft, supplied at 6 to 8 v, the parts being anodic. Perforated steel plates serve as cathodes. The solution is made with 6 oz per gal of Clepo No. 42-P, Wyandotte or Philco No. 1. In the Meaker, the temperature is 180° to 205°F and in the U.S.G. 195° to 205°F. Fifty pounds a day of cleaner are added to the Meaker tank, but, as there is considerable caustic supplied as dragout from the first U.S.G. tank, makeup is added in the second U.S.G. tank only when analyses show it to be necessary. Renewal of solution in the second tank in each line is done about twice a year. All rinses in both lines involve first a dip and, as the work is withdrawn, passage through a spray. Tanks are drained once per shift and



fresh water flows into tanks continuously to carry off contamination.

*Third Operation:* Rinse in warm water which is kept flowing, the tanks being drained and refilled daily.

*Fourth Operation:* Pickle in sulfuric acid (10 to 12 pct Meaker, 7 to 9 pct U.S.G.) to which 1 lb of Acetrol No. 100 inhibitor is added per carboy of oil of vitriol. New pickling solution is made up when iron sulfate content reaches 20 pct. Two carboys of acid and 2 lb of inhibitor are normal weekly additions. The solution is held at 140° to 160°F.

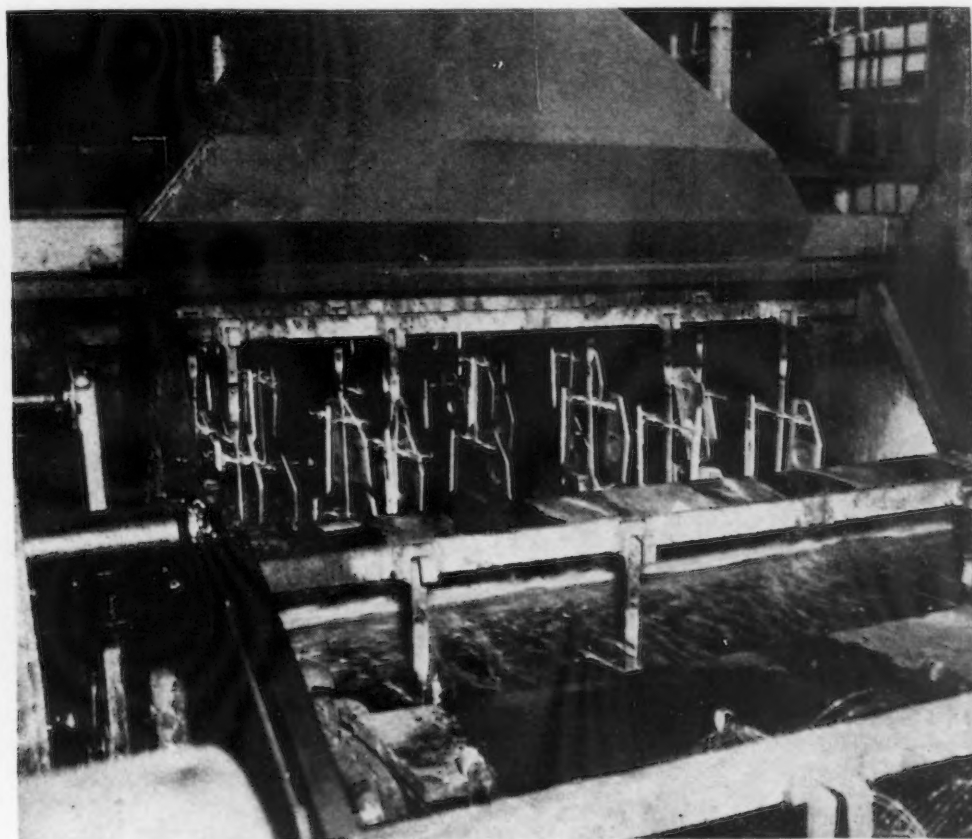
*Fifth Operation:* Rinse and spray in cold water.

maintain an anodic current density of not less than 20 amp per sq ft. Anodes are kept in bags of special knit tubing to trap particles formed, as these would cause the plating to be rough. Temperature of the bath is held 85° to 100°F and plating time is 4½ min which gives an average deposit slightly under 0.0002 in. thick. Plating tanks are of ¼-in. mild steel, have double welded seams but no organic lining.

*Seventh Operation:* Rinse in cold water.

*Eighth Operation:* Same as seventh.

*Ninth Operation:* Bright dip in 0.3 pct (by weight) solution of nitric acid which is kept at 65° to 85°F and completely renewed daily and replenished between shifts if necessary. The tanks have Koroseal linings.



#### LEFT

Rinse tanks and, beyond them, the hot air drier which the racks are entering after the final hot dip rinse on the U.S.G. line.

o o o

#### BELOW

Radio parts that have been bright zinc plated issuing from the drier at the end of the U.S.G. line. Here the parts are unracked and placed in tote boxes, the racks being hung on a chain conveyor for return to the loading end of the line.

*Sixth Operation:* Plate in the following du Pont Durobrite solution:

			Addition Per Normal Working Day
Zinc cyanide	9.5-11.0	oz. per gal.	—
Sodium cyanide	8.0- 8.5	oz. per gal.	200 lb.
Caustic soda	10.0-12.0	oz. per gal.	75 lb.
Hypo	0.5- 0.75	oz. per gal.	20 lb.
Sodium sulphide	1/60-1/20	oz. per gal.	1 lb.
RH309 brightener	4	cc. per gal.	½ gal.

Cathode current density is not less than 45 amp per sq ft and not greater than 60 amp per sq ft. Durobrite zinc anodes of not less than 99.98 pct purity are used along with about 0.2 pct mg for control of anode efficiency and sludging and enough anodes are kept in the tank to

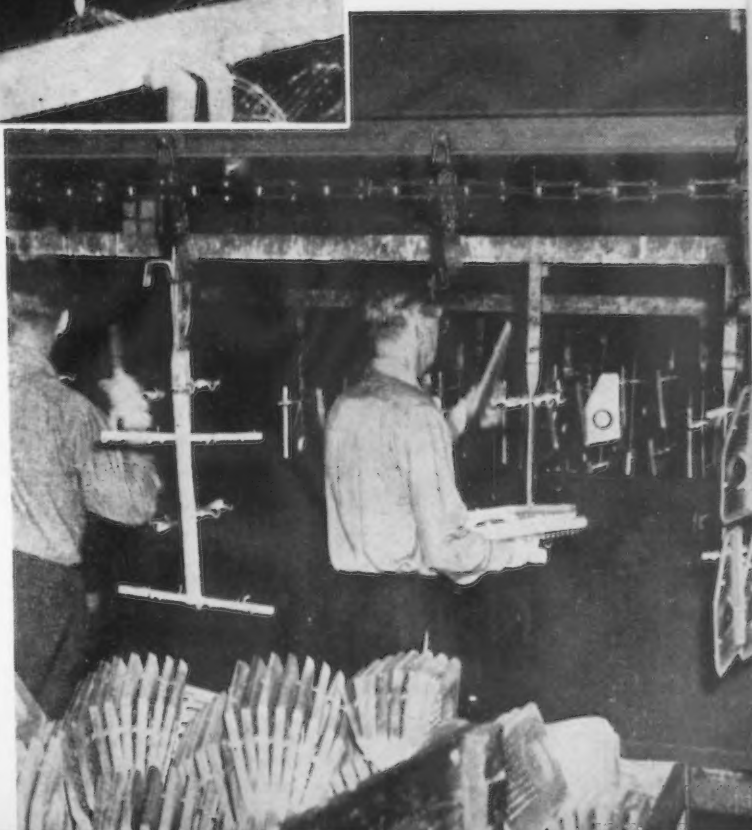


TABLE I  
Cycle of Treatment for Bright Zinc Plating

OPERATION	Meaker Equipment			U.S.G. Co. Equipment		
	Minimum Time of Treatment	Temp, °F	Maximum No. of Carrier Bars in Operation	Minimum Time of Treatment	Temp, °F	Maximum No. of Carrier Bars in Operation
1 Pressure spray washer.....	81 sec	165-195	5	.....	.....	.....
Immersion soak operation.....	.....	.....	.....	2½ min	200-210*	6
2 Electrocleaner.....	68 sec	180-205	3	68 sec	195-205*	3
3 Rinse and spray.....	Dip	Warm	1	Dip	Warm	1
4 Sulfuric acid pickle.....	32 sec	140-160	2	68 sec	140-160*	3
5 Rinse and spray.....	Dip	Room temp	1	Dip	Room temp	1
6 Plating with bright zinc.....	4½ min	85-100	9	4½ min	85-100	9
7 Rinse and spray.....	Dip	Room temp	1	Dip	Room temp	1
8 Second rinse and spray.....	Dip	Room temp	1	Dip	Room temp	1
9 Weak acid bright dip.....	9 sec	65-85	1	14 sec	65-85	1
10 Rinse and spray.....	Dip	Room temp	1	Dip	Room temp	1
11 Hot water rinse.....	27 sec	185-195	2	14 sec	185-195*	1
12 Hot air dryer.....	.....	.....	.....	3½ min	150-170	8
Time of Cycle.....	14 min.	.....	.....	19 min.	.....	.....

\* Temperature control provided for solution.

*Tenth Operation:* Rinse in cold water.

*Eleventh Operation:* Rinse in hot water (185° to 195°F) in tank with continuous slow flow. This rinse, requiring 27 sec in the Meaker and 14 sec in the U.S.G. line supplies enough heat to greatly expedite drying.

*Twelfth Operation:* Dry in air. This is accomplished in a tunnel heated to 150° to 170°F, in the U.S.G. line. All parts have to be completely free of water before they are placed in tote boxes or packed for shipment. Plated parts are removed from the department as soon as conditions permit and never are allowed to stand there more than 36 hr.

If breakdown requires either machine to be stopped more than 5 min while racks of work are in process, all parts in the plating tank, bright dip or hot rinse are considered rejects and are stripped before replating.

Anode bars in the plating tank and cathode bars in the electrolytic cleaner are kept bright by weekly cleaning. No wire brush may be used for this cleaning. It is done with steel wool and in such a way that none of the incrustations removed fall into the plating solution, as otherwise the copper that would be introduced would cause streaking of the plate.

Parts which are too small to handle efficiently in racking are bright zinc plated in nonmetallic barrels, using the same bright zinc solution used for racked parts. Cleaning and rinsing are similarly done but, of course, by shifting the barrel from tank to tank and rotating it while it is in

the tanks. Dangers are used in each end of the barrels to provide suitable contact with parts while plating. The current density in barrel plating is lower than for rack plating, but a deposit approximately 0.0002 in. thick is applied in about 40 min.

Many parts that have been given a bright zinc plate are afterward painted (enameled) and baked, primarily for appearance sake although the added coating also increases corrosion resistance. Some enamels are applied directly to the untreated zinc plate and have adequate adhesion for certain uses. In other cases, the plate is given a Bonderite treatment which not only increases corrosion resistance but provides a superior surface for painting, as a better bond with the enamel is secured.

Bonderizing is done, with the work still on racks used for plating, in three tanks, the first of which holds Parcolene Z, a disodiumphosphate solution containing a titanium salt. This 1 pct solution speeds the subsequent Bonderite action and insures complete coverage of the surface by the Bonderite No. 32 which is applied in the second dip of 10 to 15-sec duration. The latter is followed by a hot rinse and an air dry.

All three tanks for Bonderizing are near the end of the Meaker line, parts being dried under the hot air from the Modine heaters, which are adjacent thereto, before being removed from the plating racks. As only a small proportion of parts are Bonderized, the tanks are small and dipping is done by hand.



# High-Temperature X-Ray Diffraction

ONE of the important applications of X-ray diffraction is the identification of crystalline forms of substances, providing not only information as to chemical composition but also data on the particular crystalline modification present. Many crystalline substances exhibit structural changes on heating, different modifications being stable at different temperatures. In those cases where the high temperature crystalline form continues to exist after cooling to room temperature, its structure can be identified and studied in the usual way.

However, some substances revert to their normal structure so rapidly that the high temperature forms are not present after cooling. To investigate those modifications existing only at higher temperatures, as well as the rates of inversion and crystal formation, a high temperature powder X-ray diffraction apparatus by which patterns may be obtained while the materials are at elevated temperatures has been developed by the microscopic and diffraction analysis laboratory at the National Bureau of Standards.

Several high temperature X-ray diffraction devices have been made in the past, all of which use photographic film that must be kept cool to record the pattern. This limits their application to temperatures of approximately 1800°F or less. The new equipment, using a Norelco X-ray spectrometer in which a Geiger counter replaces the photographic film, may be used to obtain patterns with specimens maintained at temperatures up to 2700°F.

A resistance furnace, figs. 1 and 2, of special design replaces the specimen holder of the spectrometer. It consists of a brass base with a ceramic insert to which is attached a platinum specimen holder for the powdered sample. This is mounted in the heating element, consisting of two ceramic tubes fitting one inside the other with a platinum winding on each tube. Surrounding the heating element coaxially is a platinum radiation shield and a stainless steel shield enclosed in a brass cover. Water cooling coils are provided for the cover and the brass base to reduce the heat conveyed to adjacent parts. Openings in all elements surrounding the specimen holder allow passage of the X-ray beam. The openings in the outer brass jacket are covered with thin sheets of beryllium to prevent drafts of air and to keep radiated heat from the adjoining parts of the equipment. Beryllium is used because of its high transmission of X-rays.

The temperature of the furnace is regulated



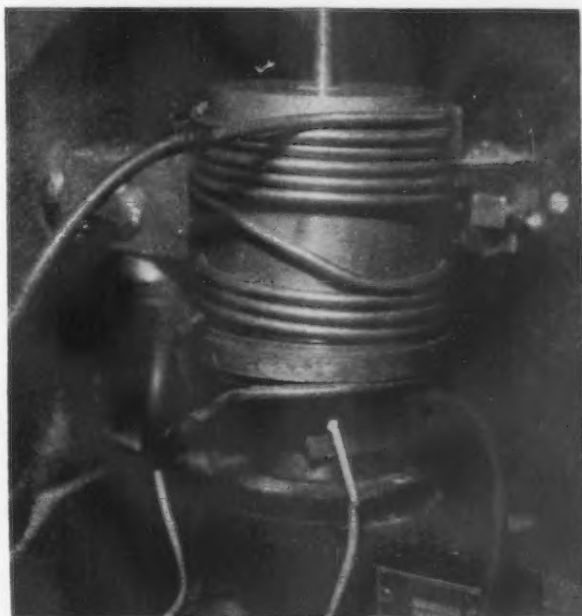
FIG. 1—X-ray diffraction apparatus for obtaining diffraction patterns of substances at temperatures up to 2700°F. The variable autotransformer (below operator's right hand) permits adjustments to other temperatures for obtaining additional patterns without intermediate cooling of specimen.

and measured by the upper recording potentiometer (fig. 1) operating from a thermocouple whose junction is placed just above and in front of the specimen. Control of the temperature is effected by the controller which puts a small resistance in the line when the required temperature is reached. The main line voltage is regulated manually by a variable autotransformer. To heat the furnace to 2700°F requires about 12 amp at 40 v.

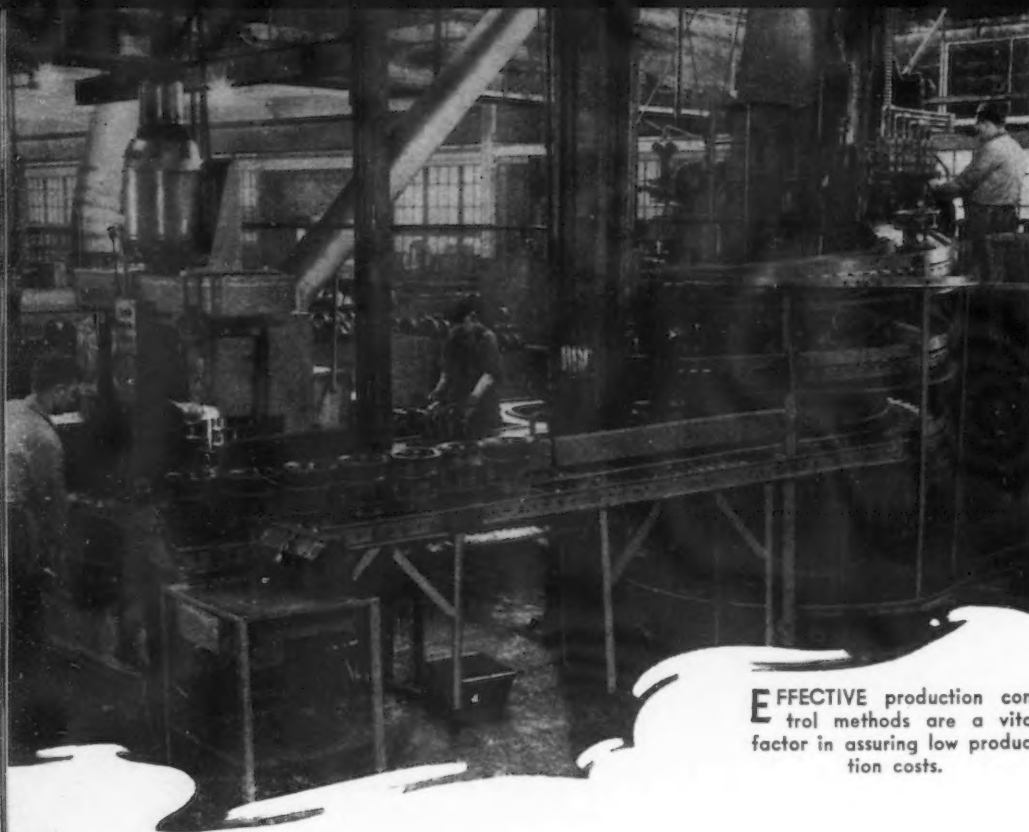
With this equipment it is possible to obtain a pattern of a sample at a specified temperature. Since the pattern is produced immediately in a usable form, requiring no photographic processing, the crystalline state of the material is readily identified. The temperature can then be adjusted to a different value and a new pattern made in a matter of minutes.

The X-ray diffraction apparatus utilizing the  
(Continued on Page 128)

FIG. 2—This small resistance furnace shown mounted in position on the x-ray powder diffraction equipment makes possible for the first time the study of certain crystalline modifications which exist only at elevated temperatures.







# Production

**E**FFECTIVE production control methods are a vital factor in assuring low production costs.

**T**HE planning division at Caterpillar Tractor Co. is responsible for providing the necessary machine tools, tooling and building layout to meet manufacturing schedules. The division is under the direction of a general superintendent, assisted by two superintendents and nine supervisors. The division is subdivided as follows: (1) Releasing and methods and (2) timestudy and plant layout. Each of these sections is directed by a superintendent. Supervisors are in charge of each principal function; such as, releasing, methods, timestudy, records, plant layout and assembly layout. Working as a unit this group has been able to improve materially manufacturing methods and plant layout conditions.

The personnel of the planning division is composed chiefly of employees who have been upgraded through the ranks. Many are graduates

*A discussion of the basic concepts of a production control department and how such a department should be integrated with other plant functions was described in the first part of this article in the June 26 issue.—Ed.*

of the company's machine and welding training programs, others are employees who have learned Caterpillar products and methods by performing outstanding jobs in the shop. As might well be imagined, persons developed by in-plant training programs and much actual shop experience produce an organization which has a precise conception of shop problems. Some 220 such people make up the planning division of Caterpillar. To give a clear picture of the functions of this division, the duties and methods of each section of the planning unit will be outlined in detail.

All releases of new designs or changed designs originate in the engineering department. Regardless of the nature of the release, engineering letters, assembly and individual piece part prints are sent as a package by the engineering department to the planning division. Hereafter, this package will be referred to as an "engineering group."

Upon receipt of the engineering group, the releasing section checks to make sure part numbers, models, engineering letter numbers, etc., are accurate and complete. After the group has been reviewed by the supervisor, it is put into the releasing system. A followup is kept on all groups and progress can be checked at any time.

The releasing system involves a multiplicity of responsibilities and duties among which are the following:

(1) Establishment of an effective date for each change or new release. To do this, it is necessary to check the delivery of dies, patterns, new tooling, rough or purchased finished material. In most groups there is a key part, one which has an unusual amount of work or is special in some other way, that governs the production or effective date of the entire group. Current parts and the number of pieces on hand is often a determining factor. Once an effective date is set, the first step is to notify the materials division by the use of a *Station List Change Notice*. The change notice, which serves as advance information, is originated by the releasing person who is handling the engineering group. Since there are other departments to consider, the station list sheet shown in fig. 1, is typed and forwarded to each section having a copy of the station list. Master books are kept and maintained in the releasing section showing current status of all releases and changes.

(2) After the effective date is set, the releasing section creates the purchase requisition for necessary dies or patterns. All such requisitions are forwarded to purchasing where the actual buying is done.

(3) A control is also maintained on all patterns and dies. Through the aid of individual records for each part number, pattern or die disposition can be determined at the time a part becomes noncurrent or canceled.

(4) The releasing section also decides whether

# Control at Caterpillar

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a part is to be purchased or worked. Its decision is influenced by the type of part, material, design and sometimes delivery dates.

(5) Major changes to product present many problems among which are tools, material and the machine tool. To better control these items, a job number is assigned to each major change. This job number is then carried as identification on tool orders, die or pattern requisitions, station list sheets, piece part prints and operation sheets. Through the use of a job number an individual tool can be readily associated with the proper group or change; also, it is helpful in following up each and every item necessary to meet a given production date.

(6) Another duty of the releasing section is to determine the quantity of material per piece. To do this, a complete record of the steel sizes for each specification of material is kept. This record permits stocking of a minimum number of sizes of sheet steel and bar stock.

The benefits of such a system are apparent from the large number of engineering changes which result from recommendations of the releasing section.

## Method Section

The work of the method section falls into three major classifications: (a) Processing, (b) gages and (c) perishable tools. Here, each part is analyzed, with due consideration given to the production requirements, methods and the best tooling to do the job.

After an engineering group has cleared the releasing section it is sent to the methods unit. Here it is put in the hands of a processor who analyzes the part and creates the *Planning Operation Sheet*, (fig. 2) on which each operation is described in detail, numbered according to the sequence in which the operation is to be performed, and showing machine number, classification and location. Later, the timestudy section supplies set-up time, time per piece, and time for the machine burden and performance hours columns of the sheet shown (fig. 2). After the operation sheet has progressed through the planning system, it becomes a master from which production work orders are reproduced for the shop according to production schedules.

The processor orders machine tools when machine load for an individual machine or group of machines indicates an overburden or when a new process is required. Purchase requisitions for machine tools are created after a thorough analysis of quotations from machine tool builders on similar types of equipment.

After the operation sheet has been written, durable tooling is ordered. To do this, the processor uses the *Die, Fixture, Tool and Gage Order*, fig. 3. This tool order specifies part number, de-

**Helpful ideas for plant executives desirous of setting up efficient production control techniques, or in improving existing departments, are given in this article, wherein the author describes in detail the functions and makeup of the various subgroups of a production control department. The discussion emphasizes the importance of developing effective liaison between each of these units.**

scription of operation, type of tool to be made, product model number, machine number and location, storage location plus various signatures which are full authority for making the tooling. Gages and perishable tools are also ordered by use of this form. These are ordered at the time engineering group progresses through the system.

In this huge plant where many sizes of diesel engines, track type tractors, marine engines, diesel electric sets, scrapers, motor graders and cable control units are made, production machining lines are separated according to type of part; that is, gears, sheet metal, pistons, crankshafts, etc. Since each present their own problems processing men are, by necessity, highly trained specialists who have developed by experience and extensive training.

The work of the methods section can be summarized as follows: (1) Writing operation sheet, (2) ordering tools and gages, (3) ordering machine tools, (4) improving method of manufacture and reducing costs and (5) following through on each of the aforementioned to a satisfactory conclusion.

## Timestudy Section

It is the responsibility of the timestudy section to establish and post to the operation sheets time for all direct labor operations for which standards can be established. Generally speaking, this includes all machining and assembly operations and excludes any operation such as the sealing of rough castings where the paint operator may be required to process a large variety of castings over a relatively short period of time. It is well to emphasize and certainly all personnel of the planning division must be impressed with the importance of accurate time. The importance of accuracy becomes more apparent when the uses made of production time are examined. They are as follows:

(1) Production time when coupled with other



MATERIAL and STATION LIST SHEET										
PART NAME	SHAFT - IDLER GEAR				ENGR. CHG.	7	W. OF P.	W	PART NO.	7B5648
MATERIAL	C.T. #1E40 STEEL FORGING - CLEANED				H.T.		W	SHEET DATE	10-7-40	
MATERIAL SIZE	ROUGH WEIGHT		GROSS WEIGHT		FINISHED WEIGHT		EFFECTIVE SERIAL NO.		CANCELLED SERIAL NO.	
SCRAP %	8.450		9.295		7.250		40 Days			
MODEL	GROUP NUMBER	QTY.	DELIVERY LOCATION				APPROX. SERIAL NO.		REPLACES	
T64	7B5853 ASSEM.	1	(P14F) 1				7J5054 4-1-41		3B6487	
T76	7B5853 ASSEM.	1	(P14F) 1				4F8940 4-1-41		3B6487	
E40	7B5853 ASSEM.	1	(P14F) 1				1N166 4-1-41		3B6487	
E54	7B5853 ASSEM.	1	(P14F) 1							

FIG. 1—This sheet typifies the record made by the releasing department on each part.

requirements of product provides the basis for planning the extent of facilities to be provided; (2) production time when coupled with other requirements also serves as the basis for scheduling operations by the production division. Through scheduling they endeavor to provide the factory with a burden of work consistent with ability to produce, and in such a way that assembly operations may be continued without interruptions; (3) the performance of individuals under direct labor is calculated by using production time multiplied by the number of pieces produced within a given period, and these calculations are made into a performance report which serves as a followup on the productivity of each worker. This is important when it is realized that this plant operates on a measured day work system without the benefit of monetary incentives and that persistent followup is necessary to maintain productivity; (4) production time is used by the accounting department in establishing cost records under the standard cost system and becomes an important factor in accounting calculations.

Production time is established in advance of actual operations by the use of standard data, feed and speed charts by the study of comparable parts, and in some instances may be based on the experience of the individual timestudy man.

With operation sheets written and tools ordered, the engineering group is sent to the timestudy section. Here the production time is established and posted to operation sheets. Actual

timestudy may be taken later to confirm or correct the estimated time.

As the timestudy is taken refinements in tooling and methods may be made which will improve the production on a given part. Accurate, practical timestudies which determine proper standards for a job and which may be used for the further building up of standard data must be made by thoroughly qualified timestudy men.

Timestudy men must be properly selected on the basis of training and experience, must be further trained in the technique of timestudy analysis, and must be provided with all the necessary tools for doing this job well. Caterpillar has under way a thorough training and followup program to make certain that each man is fully qualified for his work and capable of soliciting cooperation from all with whom he must work.

Another job which is carried on in the timestudy section is that of maintaining machine calibration data. Standard machine calibrations consist of a detailed analysis of all machines in the shop. This analysis is made by actually checking feeds, speeds, stroke, size, motors, pulleys, etc., when the machine is first received. Because of repair and maintenance problems, a working arrangement is carried on with maintenance people so no changes are made without proper notification. If the machine is changed, the machine tool is then recalibrated. Although all machine calibration sheets are not the same, a typical example is shown in fig. 4.

Tool design, timestudy, and the methods section have copies of this book. Its accuracy and completeness eliminate much guesswork and un-



necessary rechecking each time a machine tool is involved. Through the use of this book, work can be carried on from the office with a high degree of efficiency.

Assembly Layout Section

Assembly layout involves assembly operation sheets, assembly tools, racks and bins for locating material, handling equipment and method of assembly. The work of this section might well be described as establishing the methods and layout for product assemblies.

In general, assembly work is divided into the following types: (1) Engines, (2) tractors, (3) motor graders, (4) cable control, (5) scrapers and (6) wagons. Each type of assembly is handled by persons who have had extensive shop training in that phase of the work. The specifications of the engineering group may call for changing an existing assembly or providing building area and equipment for a new assembly. Up to this point this group has been processed

by the releasing, methods and timestudy sections. Its fourth and final station is assembly layout. Here the foundation is laid for assembling individual piece parts into a completed unit. The layout man arrives at a suitable method of assembly by the following steps:

- (1) Assemblies are broken down into work to be performed either on the main assembly line or a sub-assembly line. Portions of the work performed on the subassembly line are later fed into the main line.
- (2) Assembly operation sheets are written, describing the sequence of assembly. These sheets are sent to the timestudy section.
- (3) By experience or comparison with similar assemblies, and with knowledge of maximum schedule requirements, the type and tentative length of conveyer are decided upon. Some assemblies do not require conveyer lines so only floor area is involved.
- (4) Taking into consideration assembly time required and size of parts, material is located either in bins or skids.
- (5) Through checking and refinement, final conveyer length or assembly area is accurately set and material is located according to position required.

This procedure is followed for both main and sub-assemblies.

(6) The layout is then completely detailed including size, type and location of hoists, tool rails, monorails, jib cranes, inspection stations, power tools, presses, etc.

(7) The layout man requisitions all equipment required for assembly line and issues the necessary special work orders to cover installation of same.

(8) After layout is completed, approval is obtained from the planning unit supervision and from other departments concerned.

The assembly layout group also keeps records on all piece parts showing assembly line location, model, and quantity per model. These data are kept current with all engineering changes.

Records are also kept on each of the portable power tools by listing type of tool and serial number. This portable tool record card shows the assembly line location and pro-

FIG. 2—This planning operation sheet is originated by the processor in the method section and is attached to the engineer group. All time is furnished by the timestudy group.

PLANNING OPERATION SHEET										NON-CURRENT (	
Form 50-0811 TR & HH										PRACT. LOT. 80 PART NO. 4F 1774	
OPER. NO.	MACHINE		BASE TIME				EFFECTIVE-DATE	OPERATION			
	LOC. CLASS	M. NO.	HRS. PER SET UP	HRS. PER PIECE	BURDEN HOURS	PERFORM HOURS					
1	X25B	7689	1.50	.0833	1.50	1.50	TURN THREAD DIA., UNDERCUT, FORM TAPER, CHAMFER, CHASE THREADS, CHAMFER OPPOSITE END, CUT-OFF & CENTER				
	L4T			12	.0833	.0833					
2	HH19E	5087	.80	.0166	.80	.80	MILL KEYWAY				
	M3B			60	.0166	.0166					
3	HH19D	7272	1.30	.0715	1.30	.40	HOB SPLINE				
	H12G			14	.0715	.0238					
4	HH22D	4779	.50	.0191	.50	.50	DRILL PIN HOLE				
	D62S			52	.0191	.0191					
5	HH23F	B2338	.20	.0285	.20	.20	REMOVE BURRS				
	E1B			35	.0285	.0285					
										PARTS GRP. NO.	
										CURRENT	
COMP. PARTS		MATERIAL C.T. #1E-40 C.F. STEEL 1" RD. M.L.									
5B 1102		PART NAME SHAFT-CONTROL									
		MACH. PREPARED		BASE TIME		QTY.		MODEL		DELIVER TO	
		JPM 7-15-45		GB RT 10-2-45							
		MMM 10-4-45		EH 10-6-45							
		SUPERSEDES SHEET DATED		ISSUE NO.		ORDER DATE		SCHED. LOT SIZE		SCHEDULE	
		REL.				4F 1774					
		MASTER TYPED		DATE COMPLETED FOREMAN'S SIG.		PART NO.				QTY. STEEL OR CTO'S REQ'D	

vides space to the record repair and service record of the tool. Machine repair department does all repair work on portable tools and makes a report to the planning division listing repair work required and cost of same. Thus, portable tools can be watched and replaced as repairs become excessive.

### Plant Layout Section

Responsibility for the appearance of the machine shop is jointly shared by shop supervision and the plant layout section. Plant layout has the responsibility of developing all layouts that concern the machine shop. This task is performed through the use of building area drawings which are drawn to a specified scale, generally  $\frac{1}{8}$  in. to 1 ft. A print of this drawing is pasted to a layout board. This board may be made from one of several materials, but the basic requirements are that the material have enough density to hold the tacks used for securing cutouts and yet be soft enough for ease of operation. The cutouts are made to the same scale as the drawing and take into consideration the full area of the tool including the travel of table or head of the machine. The tacks used for holding the cutouts in place have round heads of different colors. Colors identify equipment as presently located, to be moved, new equipment or equipment that will not be fastened to the floor such as bins, racks, tool box stands, etc. A color scheme is also used for cutouts, different colors representing conveyers, equipment on hand, new equipment and storage boxes.

Machine shop layouts at Caterpillar can be divided into two classes: (1) Layouts necessary to take care of current changes to manufacturing methods and (2) layouts for future production.

A good example of a layout falling in the first group is one required when the engineering department changes the design of a part so its manufacture will require a certain type of machine tool not presently in the machine line. Other layouts of this type are required when new parts are added to a machine line requiring additional machine tools, fixture racks, handling equipment, etc. Groundwork for layouts of this type is handled in the following manner:

(1) The method section makes analysis of required change and requisitions the machine tool.

(2) The purchase and install order is created by the method section and a copy is sent to the plant layout section.

(3) The layout section checks requirements of change with method section processor and secures information on parts involved.

(4) Layout man takes prints and operation sheets and proceeds to make the necessary changes to existing layout to accommodate new equipment or makes entirely new layout in another department.

### DIE, FIXTURE, TOOL AND GAGE ORDER

AF-5118

Copies To: A. WIENSTIEN J. MASON  
Chrg. No. 91-8955 Eng. Mfg.  
Models A15-32  
Group CLUTCH-BRAKE & DRUM  
Eng. Rel. (X) or Ch'g # (5) On DRUM-CLUTCH INNER  
Mach. A9S P&J AUTOMATIC Mach. No. B'ldg.  
Oper. # 5, CHUCK INSIDE RIM, RGH. & FIN. TURN O.D. & HUB DRILL, BORE & REAM STRADDLE-FACE GEAR, FACE RIM OF OIL THROWER, COUNTERBORE HUB, CHAMFER & FORM RADII & UNDERCUT

Date Issued 9/23/46  
Planning Job No. 31  
Group No. 4F-5288

Requirement

DESIGN A LAYOUT OF TOOLS & EQUIPMENT REQUIRED. USE CARBIDE TOOLS WHEREVER POSSIBLE, NOTE: USE ALL TOOLS POSSIBLE FROM LAYOUT PX-118621 & PX-118622 WHICH WERE FOR USE ON M7722 & M7723 IND. TOOL ORDERS TO BE REQ. BY TOOL DESIGN.

Lead Time	60 DAYS	For	1-1-47	Production	Store In	CRIB #18
Typed By	BK	Written By	JPM	Checked By	GK (SAMPLE)	Signed G. SWARDENSKI Approved

(5) Final layout is presented for approval.

Layouts of the second group mentioned are for major changes to existing models or for an entirely new product. This type of change requires considerably more information and close cooperation from the method section. Such layouts are made through the following procedure:

(1) The method section analyzes engineering changes or new model releases and supplies the plant layout unit with operation sheet, piece part drawings, list of machine tools and machine load.

(2) The layout section analyzes the piece part drawings and operation sheet, and production requirements and determines the type of layout that is required. In all probability the line will be laid out several ways—as a straight line, miscellaneous, conveyerized, etc., before a final plan is adopted.

(3) Location of layout is determined from standpoint of transportation, size and shape of parts, distance from assembly, type of work and, possibly, from available area.

(4) When above three steps are completed, the layout is ready to be detailed as follows:

(a) Sequence of operation on all parts is studied and flow charts are made to determine most efficient location of machines on line. Machines are located so a minimum of backtrack-ing will be necessary.

(b) Handling equipment required is decided upon and provided.

(c) Size of aisle is determined from shape of parts and size and shape of boxes to be used. General practice is to provide a 6-ft aisle.

(d) Position of machine, work, tool box stand, tool racks, etc., is determined from standpoint of most efficient operation.

(e) Storage requirements between each machine operation are determined and provided for.

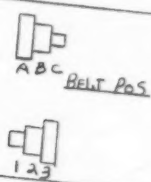
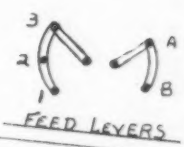
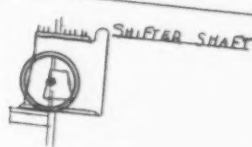
(f) Inspection, timekeeping, checkout and foremen's facilities are located in strategic spots.

(g) Once it is completely detailed, the layout is then submitted to planning supervision for approval. After approval, supervisors of the departments affected are gathered together



LEFT  
FIG. 3—The tool order shown here is issued by the method section. Properly signed, it is authority to design and make the tool.

RIGHT  
FIG. 4—Using this chart, each machine tool at Caterpillar is calibrated at the time it is put into production.

MACHINE CALIBRATION CHART		D12M
MACHINE: #C13 NATCO MULTI. DRILL (12 x 18) 16 SPINDLES		
ANALYSIS: C.E.F.		
CAPACITY		DATED 9-10-46
NO. OF SPINDLES	16	
DRILLING AREA OF HEAD	IN. 12-18	
MAX. & MIN. DISTANCE SPINDLE HEAD FLANGE TO BASE	IN. 56 1/2-42	
MAX. & MIN. DISTANCE SPINDLE HEAD FLANGE TO TABLE	IN. 3/4	
DISTANCE CENTER OF DRILL HEAD TO COLUMN	IN. 31-3 1/2	
CONTROLS		
  		
SPINDLES & HEAD		
UPPER JOINT DRIVES	IN. 1 1/4	
NOSE ADJUSTMENT	IN. 1 1/2	
STROKE OF HEAD - BY HAND WHEEL	IN. 13 1/2	
HEAD WAYS WIDTH	IN. 12	
DIAMETER OF WORKING SURFACE 4 POS. INDEX TABLE		
VERTICAL ADJ.	IN. 30	
NO. & SIZE OF "T" SLOTS	IN. 14	
CENTER-CENTER "T" SLOTS	IN. 3-3/4"	
WORKING SURFACE	IN. 7 1/2"	
BASE		
NO. & SIZE OF "T" SLOTS	IN. 22-26	
CENTER-CENTER "T" SLOTS	IN. 3/4	
MOTOR	H.P. 7 1/2	
MOTOR	R.P.M. 1730	
MAIN DRIVE		
MOTOR	H.P. 7 1/2	
MOTOR	R.P.M. 1730	
COOLANT PUMP		
OVERALL DIMENSIONS		
LENGTH	IN. 102 1/2	
WIDTH	IN. 46	
HEIGHT	IN. 125	

and an agreement is reached. Many times the shop foreman directly involved will spend several days in the planning division becoming thoroughly familiar with the new layout and parts involved.

(h) Special work orders are then written covering all work necessary to install layout. Installation date is decided upon from: (1) Date equipment on order is to be received or (2) status of production material in shop if layout is to be rearrangement of a present facility.

(i) Installation of layout is scheduled with maintenance department a minimum of 2 days in advance of installation date.

#### Records Section

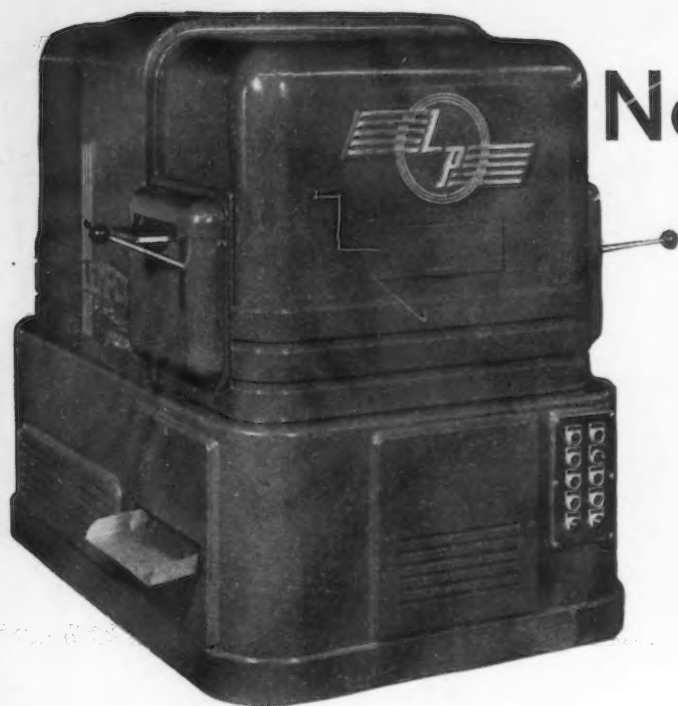
This section centralizes all records, avoiding duplication of effort which might occur if separate records were kept by each section of the planning division. An important duty of this section is the typing of tool orders, departmental reports, etc. After typing of these forms, copies

are separated and routed to the various persons and departments concerned. Copies are retained for reference when required.

Another function is keeping a numerical record of all machine tools and their shop location. This record is kept current as each machine is moved. At the time a purchase requisition is created for a new machine tool, a number is assigned and the machine number record book brought up to date accordingly. Since other departments also have copies of this book, it is necessary to correct these copies also.

Records of all equipment requisitioned by the planning section are retained and followup is established according to desired delivery date. In these records it is possible to find the purchase order number, machine number, description of item, price, application of item and delivery date. A monthly report on status of machine tools is also made from these records.

Summarizing, this section is looked upon as a service section for the planning division, keeping records that might otherwise be neglected.



# New Press Operates at

**Under development for several years, a radically new type of punch press has just been placed on the market. Differing in almost every respect from conventional types, it operates at speeds up to 1800 strokes per min and is so completely free from vibration that no provision is made for bolting it down to the floor. How this machine operates and how the high speed production is obtained is described herein.**

**FIG. 1**—Electrically operated and fully automatic, the Lempco Hypermatic press, shown here in the 10-ton model, differs in almost every respect from conventional presses.

**C**URRENT trends in manufacture point very clearly to greatly accelerated machine speeds as a means of increasing productivity per man. This trend has also been carried into the punch press field by a completely new machine which, although only just announced publicly, has actually been in full scale operation for the past 2 years. Invented by Guy W. Connors and produced by Lempco Products, Inc., Cleveland, the machine is designated the Hypermatic and operates at speeds up to 1800 strokes per min.

As shown in fig. 1, the mechanism is completely enclosed, and the press bears no resemblance either in appearance or operation to conventional punch presses. Whereas the action of conventional presses is reciprocal, the Hypermatic employs a rotary motion in actuating the dies. Four crankshafts are used; the upper two, rotating clockwise, drive the upper workhead, while the lower two, counter-clockwise in motion, drive the lower workhead. Each crankshaft is driven by a separate motor, the two being matched for speed, and any slight speed inequalities are taken up in the gear transmission, which assures a simultaneous action on both crankshafts.

The die members, mounted in Lempco antifric-tion die sets, are carried between the two workheads, the punch holder being fastened to the upper head and the die holder to the lower workhead. The punches and dies, therefore, have the same rotary motions as their respective workheads, closing and opening in each cycle of the crankshafts.

The stock is fed from right to left through friction feed rolls to and through a stripper plate which shuttles back and forth on a hori-

zontal plane with no vertical movement whatsoever. Both the punch and die approach and recede from the stock, leaving it entirely free to move from one station to the next without interference.

No flywheels are incorporated in the design of the press because flywheel velocity is not needed to develop full tonnage. Instead, due to the rotary action of the heads, there is the advantage of radial load with a nearly perfect toggle action formed as the two heads roll together and meet in the cycle of operation. Therefore, very little impact is transferred from the stamping action to the crankshafts and the wear on the crankshafts and eccentrics is negligible. The press can be jogged through any part of a complete cycle; the 10-ton model can be rotated with a 12-in. wrench on one of the crankshafts; the 50-ton model is equipped with a 2-hp motor for jogging.

The crankshafts rotate in antifric-tion bearings and are driven through a transmission of precision machined herringbone gears, meshing both horizontally and diagonally. This geared transmission is completely enclosed in the main housing and operates in an oil spray.

Conventional or hitch feeds are of little value when operations call for stock feeds of 1500 lineal inches or more. It is a well-known fact that it is practically impossible to control stock feed at approximately 1200 ipm on the conventional punch press. The stock may or may not feed up to the stop perfectly; it may feed too fast and rebound, or in case of light gage stock, may feed too fast and buckle.

The feed mechanism of the Hypermatic press is heavily built, roller type, positive in action and feeds stock with precision at the highest operating speeds. The feed roll speeds are synchronous with both press speed and pitch of the part being produced. The maximum in stock feeds is approximately 5600 lineal ipm on the 10-ton model and 10,000 lineal ipm on the 50-ton model.



# es at 1800 Strokes Per Min

By H. E. LINSLEY

Machine Tool Editor,

THE IRON AGE

The accuracy of this stock feed at these high speeds, frequently without the use of pilot pins in the dies, is remarkable.

The feed roll mechanism, as shown in fig. 2, can be used to feed stock continuously, or in cases where pilot pins are necessary, the rolls may be cracked at any point in the cycle so that the stock may be carried through either entirely or in part by the die members themselves. For ease of handling stock for the setup or die tryout, the feed rolls may be cracked manually by means of a hand lever. The feed roll mechanisms are set up on both sides of the press and either or both of these assemblies may be engaged, disengaged or quickly removed according to the requirements of the job.

The drive of the feeding mechanism is positive by means of a gear train. Changes in feed roll speed are made through the use of change or pick-off gears. For extremely fine adjustments requiring a slight amount of overfeed or underfeed, the feed rolls may be ground to a smaller diameter or replaced with rolls of a larger diameter.

Before the press can be started, it is first necessary to start the oil pump. As soon as sufficient pressure is developed, as indicated by a green light on the instrument panel, the press may be operated. Should anything interfere with proper oil pressure during a run, the green light will flash off and the driving motors will automatically stop.

In the event of overheating, this condition is shown by a red light on the instrument panel and the driving motors automatically stop. A thermal switch set for 180°F is an added protection, although in the 2 years in which Hypermatic presses have been in operation, not one of them has developed more than a normal temperature.

As yet, very little is generally known about the advantages of velocity in a stamping operation. Heretofore, on other presses, the cut was made at the slowest motion of the ram; just before it came to a complete stop and returned to complete the cycle. This mushing-through operation cut about 25 pct of the stock and broke the remaining 75 pct and at the same time created friction which generated high heat absorbed by the die. This is detrimental to the tools. With the Hypermatic press there is about a 10 pct cut and a 90 pct break producing a superior stamping with less burr, distortion and draft than would be ordinarily possible. At the speeds employed it is common practice to register the stampings so close together that the scrap between blanks is less than the thickness of the metal itself and stands up perfectly instead of mushing down as would be customary. On long runs, the stock saving is substantial.

This velocity also reflects itself in die life. The

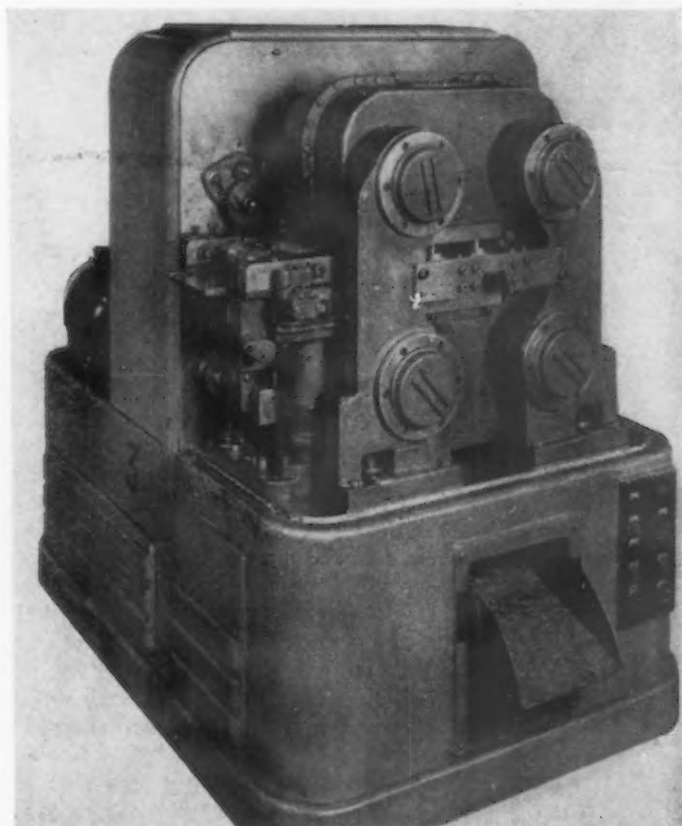
quick, sharp cut and break eliminates to a great extent the heat-creating friction, and the die and the parts therefrom are never uncomfortably warm even after a long continuous run.

Punches of even small dimensions stand up unusually well with little or no breakage, and it is quite immaterial where the punch and die engage the stock for the first and last hit of a strip of stock. The Hypermatic will stamp out halves, quarters or minute fractions of a stamped part without damage to the punch or cut edge. The motion is so rapid that there is no chance for deflection, and the punches pierce through the metal before vibration begins.

While, obviously, coiled strip (or so-called flat wire) is preferable for long production runs, straight cut strip can be used with completely satisfactory results; in fact, due to present difficulties in obtaining coiled strip, the bulk of the work in Lemco's stamping division is produced from straight cut strip. A feed register mechanism may be employed where a full blank is desired at the beginning of the strip. Where, however, fractions of blanks are not objection-

(CONTINUED ON PAGE 127)

FIG. 2—With covers removed, the stock feed rolls and their timing mechanism are visible at the left. This setup is producing lock washers at the rate of 1700 per min, with almost half a million between die grinds.



## ... Visual Skills Versus Employee

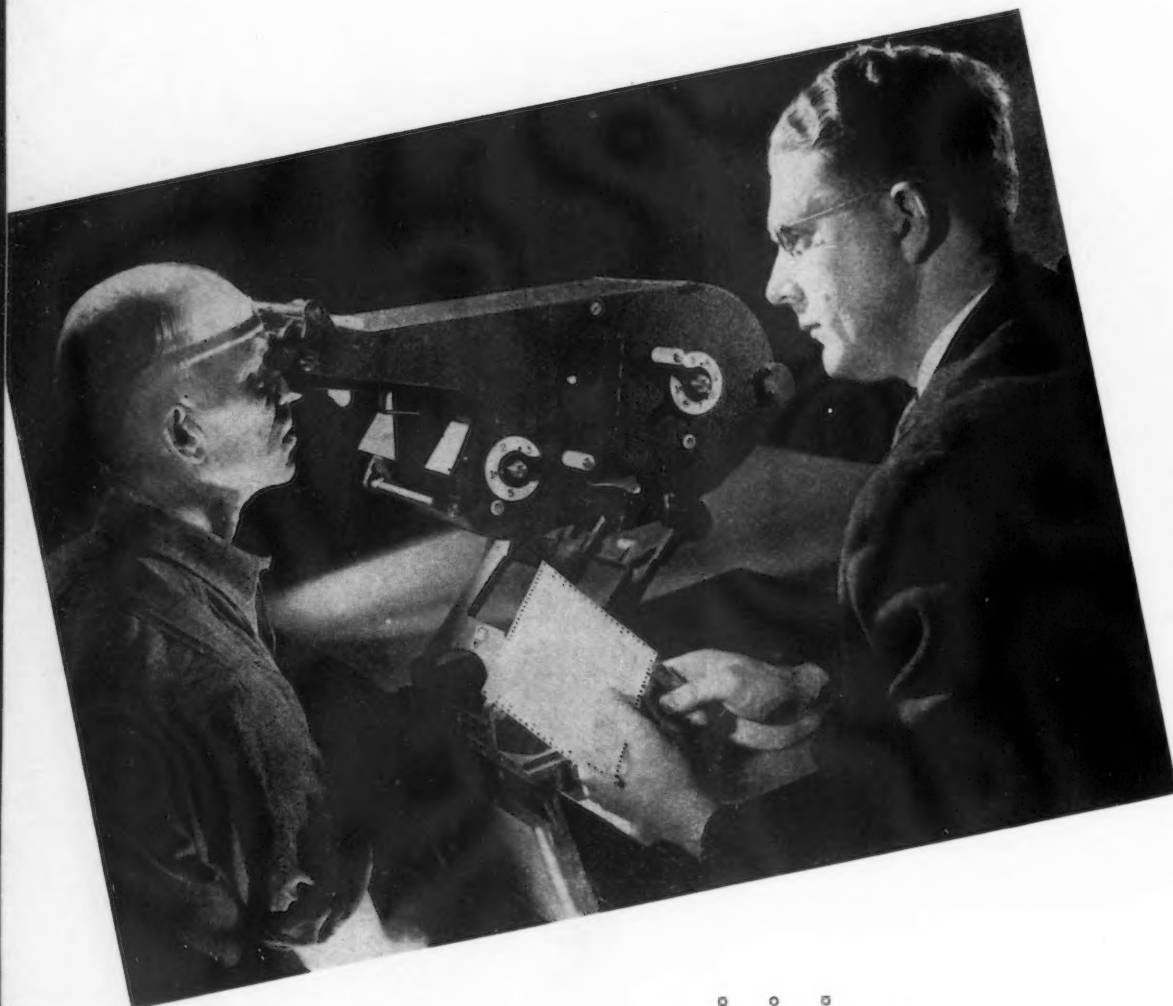


FIG. 1—Using a Bausch & Lomb Ortho-Rater for checking a worker's visual skill.

By NEWELL C. KEPHART

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IN recent years industry has been giving increasing attention to the selection of its employees. It is now generally recognized that all individuals are not equally successful on a given industrial job. While one worker is able to perform very satisfactorily, another worker may not be able to perform successfully on the same job. Similarly a worker who may not be able to perform adequately on one industrial job may perform very successfully on another job in the same plant. It therefore is very important to industry that each worker be placed on that job where he can perform most adequately. Even on what appears to be extremely simple industrial tasks, these same differences in performance between individuals can be noticed. This variation in the performance of various workers on the same job has caused many industrialists to con-

clude that no machine in their shop is more efficient than the worker operating it.

This recognition of the necessity for placing each worker on a job where his performance will be most successful has led to a search for those factors within individuals which may account for this difference in performance. Differences have been found between individuals in skills, attitudes, knowledges and basic physical equipment, and these differences have been shown to be related to the observed differences in ability to perform on an industrial job.

One of the functions in which individuals differ and which difference has been shown to be associated with job success is vision. Vision is no longer considered a unitary ability which individuals possess in varying degrees. It is no longer considered that an individual *sees well* or *sees*



# Efficiency . . .

**Is there a relationship between inadequate vision and product rejects—between visual skills and safety records? The author of this article says yes, there is, and cites facts that show a very definite coordination between worker efficiency and visual skills. The case histories reported herein serve also to emphasize the possibilities for increasing employee productivity by taking visual skills into consideration when assigning workers to a job.**

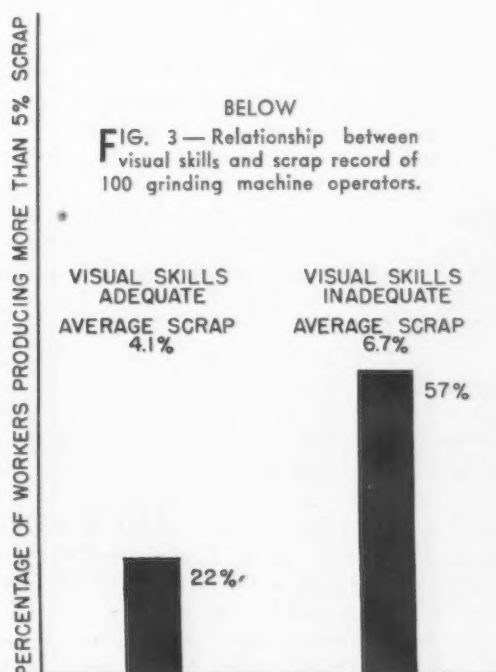
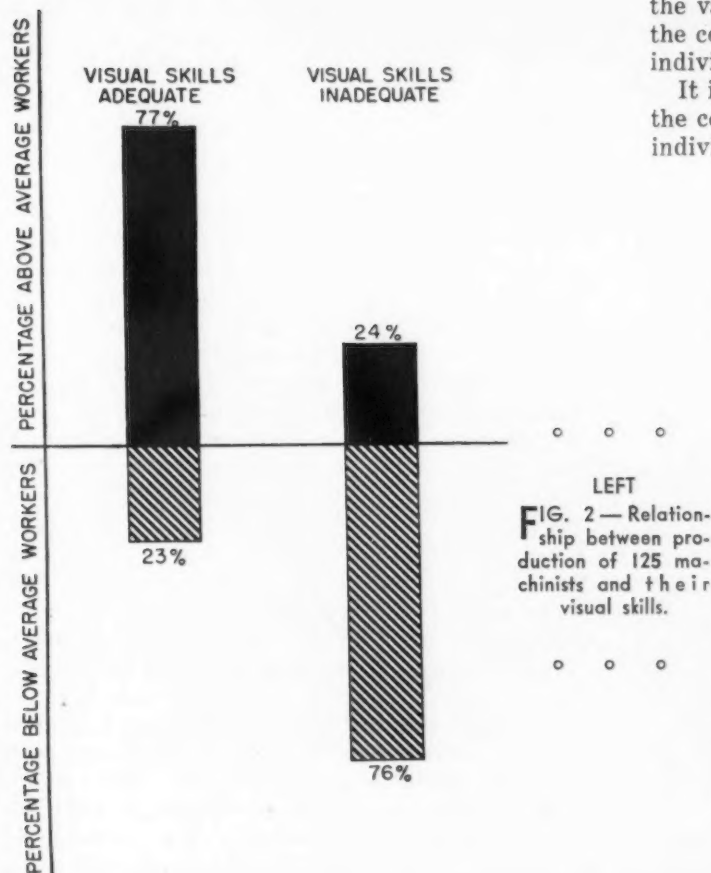
poorly. Vision is now considered to be a collection of skills which in combination constitutes the individual's ability to respond on the basis of visual cues. The ability to recognize fine detail at a distance, the ability to recognize fine detail in objects close to the eyes, the coordination between the two eyes, the ability to distinguish which of the two objects is closer, and the ability to distinguish between colors are some of the skills which combine to constitute the visual function. Not only do the quantities of each separate skill vary from individual to individual but the method of combination of these skills also varies from individual to individual.

It has been found that not only do the combinations of visual skills vary from individual to individual but also the combination of visual skills required for successful performance on industrial jobs varies from job to job. Thus an individual may have adequate vision for one job

but at the same time have inadequate vision for another job in the same plant. The demands placed upon these visual skills by industrial tasks vary from job to job so that it is not a question of an individual having *good vision* or *poor vision* but a question of his having the proper combination of visual skills required for the particular job on which he is working or for which he is being considered.

Vision, as it applies to the success of an industrial employee on his job, is thus not a single ability which can be measured with a single test, such as a letter chart on a wall, but is a combination of various visual skills which must be measured with a battery of visual tests. A number of such visual battery tests are on the market and can be obtained for industrial use (the telebinocular, the sight-screener, the Ortho-Rater shown in fig. 1). These tests reveal the performance of an individual on a number of different phases of the visual function. A comparison of the various scores yielded by these tests reveals the combination of visual skills possessed by the individual.

It is not enough, however, merely to determine the combination of visual skills possessed by the individual. It is also necessary to know the com-



bination of skills demanded by the job. Statistical methods have been developed by which the visual demands of the job can be accurately and precisely determined.

When the visual demands of a job have been scientifically determined and when individuals have been identified who possess the visual skills demanded by the job, the relationship between adequate vision for the job and success on the job can be observed. These relationships are frequently striking.

The relationship between vision and industrial success was investigated in a plant producing heavy iron castings and fittings for use in ship-building operations. Some 125 machinists in this concern were rated by their supervisors into two groups, those doing better than average work

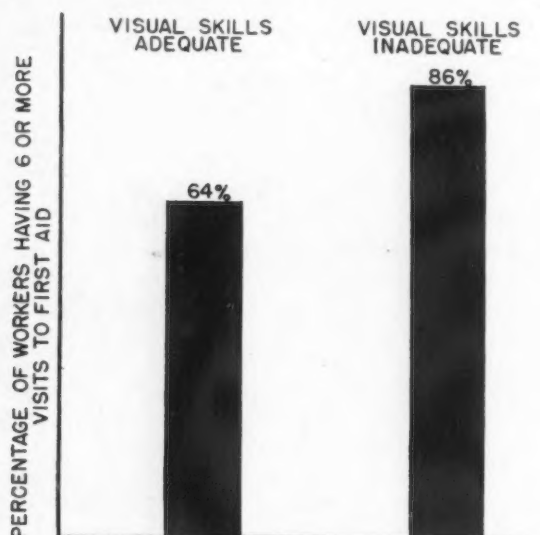


FIG. 4—Relationship between visual skills and safety records of employees of a forge shop.

and those doing poorer than average work. The visual demands of this particular job were scientifically determined and the visual skills of these machinists were tested. It was found that 74 of the 125 machinists had the visual skills demanded by the job while 51 did not possess these visual skills. Among those workers who possessed the visual skills demanded by the job, 77 pct were rated as above-average workers and only 23 pct were rated as below-average workers; whereas among those who did not possess the visual skills demanded by the job, only 24 pct were rated as above-average workers and 76 pct were rated as below-average workers. This is shown graphically in fig. 2.

It can thus be seen that workers whose visual skills were adequate for this job were much more frequently rated above average and those workers whose visual skills were not adequate were much more frequently rated below average. It is apparent therefore that these visual skills are important for success on this job and that a worker or applicant who possesses the required visual skills has a much greater likelihood of becoming an above-average worker.

In another instance, a company concerned with the manufacture of parts for internal combustion

motors found that a large proportion of scrap was being produced due to improper grinding. This company investigated the visual skills of 104 grinders to determine whether or not there was a relationship between the visual skills possessed by the worker and the amount of scrap produced.

The visual skills required for the job of bore grinder were determined and these 100 workers were given a visual skill test. It was found that 70 of the workers possessed the visual skills required by the job and 30 did not possess the visual skills required by the job.

The percentage of scrap produced by each worker over a 24-week period was computed. The amount of scrap produced varied from 0.9 to 25.9 pct. The largest proportion of the workers was producing less than 5 pct scrap. Only 32 pct of the workers were producing more than 5 pct scrap. It was thus apparent that the large amount of scrap produced in this department was due to approximately a third of the workers who were producing relatively large amounts of scrap.

The scrap produced by those workers whose visual skills met the requirements of this job was compared with that produced by those workers whose visual skills did not meet the requirements. Among those workers whose visual skills were adequate for the job 78 pct produced less than 5 pct scrap and 22 pct produced more than 5 pct scrap. Among those workers whose visual skills were not adequate for the job only 43 pct produced less than 5 pct scrap and 57 pct produced more than 5 pct scrap. The average worker among the group whose visual skills were adequate produced 4.1 pct scrap while the average worker in the group whose visual skills were inadequate produced 6.7 pct scrap. These data are shown graphically in fig. 3.

It was, therefore, apparent that the visual skills possessed by the worker were related to the amount of scrap produced. Through attention to these visual skills this company was able to save a considerable amount of money by reducing the number of pieces scrapped as a result of improper grinding.

A company manufacturing electrical parts discovered a marked variation in the efficiency of punch press operators. This company had established a standard day for this job and had computed for each worker the percentage of this standard day produced each day for an 8-week continuous period. These percentages varied from 63 to 193. Whereas the poorest workers on this job were producing only a little better than a half of the standard day, the best workers were producing almost twice a standard day. The average workers was producing approximately 130 pct of a standard day. It was felt that there might be a relationship between the visual skills of these punch press operators and this marked variation in production.

Among these operators, 23 were found to possess the visual skills required by the job and 7 were found not to possess the visual skills required. Among the 23 operators who possessed the visual skills required by the job, 65 pct were achieving better than 130 pct efficiency while 35 pct were achieving less than 130 pct efficiency. Among those workers, however, who did not



possess the visual skills required by the job, only 14 pct were producing more than a 130 pct efficiency while 86 pct were producing less than 130 pct efficiency. Of all the workers producing less than the average amount, only 43 pct possessed the visual skills required by this job. Among all the workers producing more than the average amount, 94 pct possessed the visual skills required by the job.

Visual skills are also frequently associated with safety factors. A concern manufacturing heavy steel forgings found that in one department of the plant a large number of minor accidents, requiring visits to the first aid department, were occurring. A record was kept of the number of visits to the first aid department made by each worker over a 20-month period. The number of visits per worker varied from 0 to 74.

From these data and visual test scores, a combination of visual skills was identified which was associated with safety. Among 133 workers in this department, 70 possessed these visual skills and 63 did not possess these visual skills. Among those workers whose visual skills met the standard, 36 pct had had less than six visits to first aid, and 64 pct had had six or more visits to first aid, as shown in fig. 4.

Among those workers whose visual skills did not meet the standard, however, only 14 pct had had less than six visits to first aid, while 86 pct

had had more than six visits to first aid. Of the total number of workers who had visited the first aid department six or more times, 55 pct did not have the visual skills necessary for safety; whereas among the total number of workers who had visited first aid less than six times, 74 pct possessed the visual skills required for safety.

Examples such as these cited above can be multiplied many times. Visual skills of industrial workers are associated with successful performance on the job in terms of production, quality, safety, training time, turnover, and similar aspects of the industrial problem.

Visual skills, unlike many of the skills in industrial work, are not static. They change with age and with special conditions of seeing. They can be improved through professional attention to the eye and the visual function. Industrial vision no longer means merely attention to conditions which may result in external injury to the eye. It now includes, in addition, the determination of visual skills possessed by the workers and demanded by the job to facilitate placement of workers on jobs where their visual skills are adequate, and, further, professional attention to improve and maintain the visual skills possessed by workers already on the job. Such an industrial vision program has repeatedly demonstrated its ability to increase earnings through increasing employee efficiency.

## Miniature Electric Motors Feature New Principle

**E**MPLOYING an electromagnetic principle hitherto unknown in electric motor design, and built along entirely unorthodox lines, a series of tiny electric motors known as Electrotors are now being produced by Rev Motors, Knowley House, Bolton, England. They are manufactured in four sizes, of which the smallest is 3/16 in. diam and 3/16 in. wide, and it is planned to make 5 million in 1948 when full production is attained.

The smallest motor weighs less than 1/28 oz, and operates at 7000 rpm on 1½ v. The other models are 7/8 in. diam, 9/16 in. wide; 1½ x ¾ in., and 1½ x 1½. As shown in the exploded view, fig. 1, the motor consists of a permanent ring magnet (e), a gap-ring armature winding (f) mounted on a bobbin (i) and spindle (j), two end plates (b) with contacts (a), cover tape (c) and two securing clips (d). The edges of the winding are bared and the contacts bear directly on them. The winding has a core of iron wires (g) of high permeability, cased in an insulating coat upon which several layers of double nylon covered copper wire (h) are wound in such a way that current flowing between the contacts energizes all the layers.

Each motor is subjected to rigorous tests by complex equipment which automatically rejects any that fail to reach the requisite standards of speed, torque, consumption or efficiency. Effective life tests are also conducted by running to destruction the exact life and total number of

revolutions being automatically registered without contact with the rotor spindle.

Anticipated uses for these tiny units include scientific instruments, toys, models, fans, windshield wipers, cameras, projectors, and general industrial purposes.

A larger series for industrial use and of slightly modified design are also being produced. These have silver, spring-loaded, replaceable contacts running on a reinforced winding, and are fitted with self-aligning bearings.

FIG. 1—Exploded view of the new miniature electric motor which, in its smallest size, measures only 3/16 in. diam. and 3/16 in. wide.

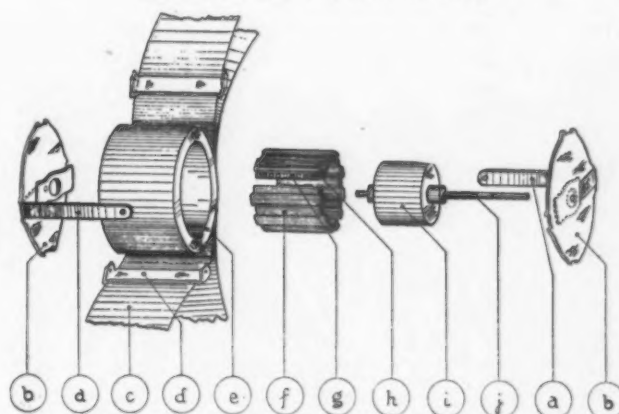




FIG. 1—Equipment for high-voltage drilling in the Interferometry laboratory of the National Bureau of Standards. The diamond blank is cemented on a brass block and the electrode is lowered onto the diamond surface.

## New Method for Drilling Diamond Dies

**A** NEW, electrical method, for drilling small diamond dies, used in drawing and shaping extremely hard and fine wire, has been developed at the National Bureau of Standards, eliminating almost 100 man-hr from older processes.

Although dies of tungsten, molybdenum, or boron carbide have, in recent years, competed with diamond dies, the diamond is still the only tool used in shaping the harder and tougher materials, such as chrome-nickel, brass and phosphor bronze, and high-carbon steel wires. Moreover, wires finer than 0.015 in. diam can be drawn only by diamond dies. In addition, the diamond is indispensable whenever precision of size and perfect roundness are essential considerations.

A diamond die consists of five surface areas: The primary cone, the secondary cone, the reduction cone, the bearing, and exit cone. The primary cone is drilled by means of high-voltage sparks formed at the point of a needle electrode in contact with the face of the diamond. These sparks release the energy stored in a condenser which has been charged to a high voltage by a transformer. The condenser is charged through

a quenched gap consisting of a number of very small gaps in series.

When rising voltage is applied to the circuit, sparking occurs first at the quenched gap. This is followed, as the voltage is increased, by a discharge across the face of the diamond between the needle electrode and the brass block on which the diamond is mounted, see fig. 1. Without the quenched gaps in the circuit, the discharge would be a more or less continuous arc, overheating the diamond and producing a dark deposit on its surface. The rate of drilling increases with the power input into the circuit until a limit is reached where the temperature of the diamond is too high and its surface takes on a frosty appearance. The drilling needle, which is 0.02 in. diam, becomes red hot at its tip before this frosting point is reached and the reddening point of the electrode is used as a criterion in adjusting the power input to the circuit.

The secondary cone is formed by the action of a low-voltage spark in an electrolytic solution. The diamond is mounted on an insulating post in a shallow glass dish and enough of the electrolyte is used to fill the dish and just cover the

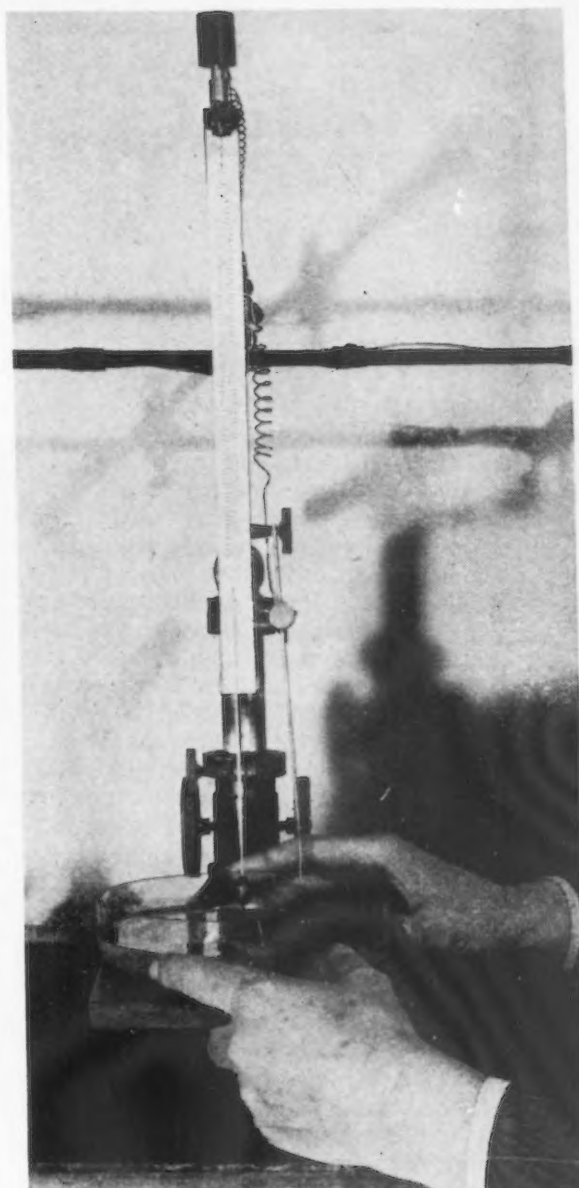
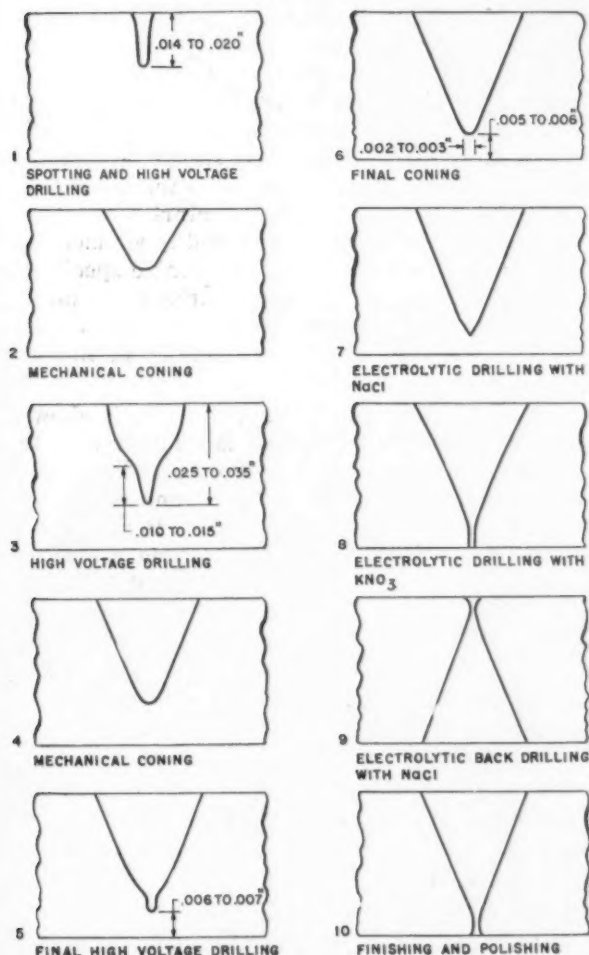


diamond. The drilling electrode is a platinum-iridium needle that is lowered into contact with the bottom of the primary cone (see fig. 2) and rests with very light pressure (around 1/5 g) on the diamond. A second electrode dips into the solution at some distance from the diamond.

When a low voltage (around 90 v) is applied between the electrodes, sparking occurs at the tip of the drilling needle and a smooth-walled conical hole is formed in the diamond directly under the needle. The shape of the hole and the angle of its walls are controlled by the type of electrolyte used, while the hole size is controlled by the pressure of the needle against the diamond. The power input into the circuit is controlled by the depth of the solution covering the diamond and by the voltage applied.

The National Bureau of Standards method of making small diamond dies consists essentially of ten steps, see fig. 3, which combine electrical with some mechanical drilling. The die blank which is used in these operations has two plane-parallel faces between which the die will be formed, and a side window for viewing the progress of the drilling. These are cut on the diamond, using a rotating cast-iron lap with diamond powder as an abrasive. The cutting action of the lap is accelerated by the application of a

**FIG. 3**—Ten successive steps in making small diamond dies. This method, combining electrical and mechanical operations, has reduced the average time required for making a die by more than 100 hr.



**FIG. 2**—The National Bureau of Standards equipment for electrolytic drilling. The drilling electrode is supported by a coil spring and rests lightly on the diamond. The second electrode dips 4 to 5 mm deeper in the electrolyte solution, completing the circuit and causing electric arcing at the surface of the diamond.

high-voltage electric arc across the face of the diamond being cut.

Electric drilling takes 7 to 15 hr, depending on the type of die, with 10 hr as an average for this new process. Actual manhours are considerably less than this, averaging about 2 man-hr per die, because almost every stage in the process is easily adaptable to multiple production.

In contrast to the condition found in mechanically drilled dies, cones produced by either the high-voltage or the electrolytic drilling process show no strain in the surrounding material when examined under polarized light. The freedom from strain and fractures results in less wear as the die is used to draw wires. The electric method requires no special skills or long training on the part of operators. Equipment is inexpensive and the drilling technique is simple, making the work less tedious and more practical for small as well as large scale enterprise.

# How to Use Carbide Cutters for Milling

By H. A. FROMMELT

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CONVERSION of the milling operations to carbide on a large electric motor frame presents some interesting material for consideration. The use of available equipment is the first management order that must be rigidly observed. The cost of the conversion must be restricted to the investment in perishable tools. The operations performed with high speed steel milling technique can be changed fundamentally only if the machine tool equipment is not differently designated and the fixtures changed.

With these limitations the conversion to carbide is undertaken. Limitations are not used here in a derogatory sense; if a current job such as this is set up for continuous scheduling, and can be converted to carbide with a show of greater productivity, then management can justify consideration of capital investment for new machine tools. And while this is not always a sound argument it is probably the kind of argument that will be met for some time in industrial America. The technique of carbide steel milling is so revolutionary that it is unreasonable to expect executives to embrace it wholeheartedly without some show of factual justification.

The motor frame under discussion is an interesting combination of boiler plate weldment and steel casting. The rear end, nearest the observer in fig. 81, is a steel casting section that has been welded to the boiler plate. The di-

ameter is approximately 40 in. and the overall length about 70 in.

The frame is securely and adequately held in a trunnion type of fixture, the end plates of which are equipped with indexing holes. Thus the frame can be rotated and locked into the various positions called for by the milling operations that must take place when using a horizontal machine.

The machine on which this milling operation was being performed at the time the conversion project was initiated was a horizontal type. The designation of this machine tool for this operation was necessary since originally both the boring and facing operations in addition to milling must be accomplished on the same piece of equipment. Subsequently the design of the frame was changed, but machine tool loadings still made it necessary to continue the milling on this machine.

No conversion operation is intelligently approached unless the machines available are understood, evaluated and the odds they impose are clearly appreciated. The horizontal mill is a precision machine tool that only incidentally is intended to hog off metal. Not one of the operations on this frame calls for close tolerance specifications. Hence the tool, to start with, is a handicap to the job in hand. A bed type machine, open side, or even cross rail of suitable specification, would remove this metal without too much concern for the niceties and with plenty of removal rate per minute. And that is all that is wanted here.

A typical high speed steel operation is shown in fig. 81. The use of coolant is a minor feature of this illustration which serves to indicate the considerations that must precede any action in a proposed carbide conversion plan. It must first be decided whether the operations as presently performed are sound from a milling standpoint. If a conversion is to take place, the substitution of a new cutting material and corresponding technique is a poor start if the operation fundamentally is poorly conceived.

Attention therefore is directed to the use of a 45° high speed steel cutter, shown in fig. 81 for the milling of the 45° chamfer, or face, on a portion of one of the so-called axle pads. This operation should be performed, even with high speed steel, with a plain face mill. The frame can be indexed around through 45°, the bar raised to meet this surface and the operation per-

FIG. 81—Original operation with high speed cutter for milling a 45° chamfer on one of the axle pads.





## ... A Practical Conversion Problem

**Taking as an example the frame of a 700 hp electric motor composed of a cast steel section welded to a boiler plate weldment, and which is in continuous production, the author outlines the problem of converting to carbide milling operations from the standpoint of both management and production personnel. In this first of two sections, axle pads and chamfers are considered, and the savings that could be effected by the use of higher powered equipment are explained.**

formed at one tenth the expense. In fact, the same cutter used to mill the axle pad surfaces, see fig. 82, can be and is now being used to mill this 45° chamfer. This is effected without a cutter change, representing considerable saving in time.

### Milling the Axle Pads

The first operation to be converted is the milling of the axle pad as shown in fig. 82. The limitations of the machine tool must be kept in mind when arriving at the specification of the cutter, the cutting material and the operating characteristics.

The machine has available a 10 hp motor; the top spindle speed is 200 and the top feed rate is 25 ipm. Moreover, management has issued an order that this spindle speed is to be limited to 150, due to the tendency of the bar to overheat when operated for long periods at the top speed.

The axle pads are on the weldment side of the frame and hence, being of boiler plate, should

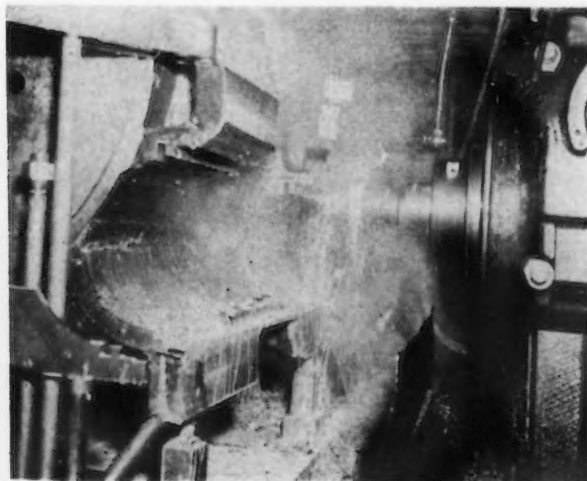
be milled at somewhere between 600 and 900 sfpm. Choosing the lower bracket rate, the rpm of the bar must be 260 with a 9-in. cutter, whereas the top limit is 150. Hence the limit for this operation is 352.5 sfpm.

If the full 10 hp could be used, 20 cu in. of this boiler plate, low carbon steel weldment could be moved each minute. However, the operation must be restricted to half this removal rate because of the nature of the horizontal bar and its tendency to vibrate excessively when extended as shown in fig. 83.

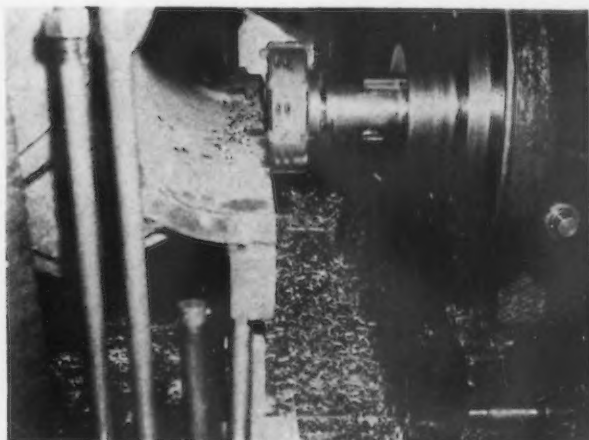
The operation will be hobbled then to 10 cu in. of chips per min. This confines the choice of cutter to a step mill, in which each blade is set in its own circle and mills on its own step or path. This cutter design is particularly effective and recommended where the feed rate is for any reason restricted.

The 9-in., eight-bladed step mill mills actually four steps; that is, two of the brazed tip shanks or blades are set on the same plane. The com-

**FIG. 82**—High speed steel operation on an axle pad surface. Note the fog produced by the use of coolant and the fact that a different cutter is necessary from that used in the operation in fig. 81.



**FIG. 83**—Machine tool limitations and poorly designed fixture necessitating undue cutter extension restricts the metal removal rate on the axle pads to 10 cu in. per min, even with a carbide cutter.



Previous articles in this series covering  
carbide milling were as follows:

Part No.	Subject	Issue Date
1.	Fundamentals of carbide milling.	Feb. 13, 1947
2.	Low carbon steel and wrought iron.	Feb. 20, 1947
3.	Straight carbon cast steel.	Feb. 27, 1947
4.	Heat-treated steels.	Mar. 6, 1947
5.	Armor plate, heat-treated alloy steel, stress proof steel, die plates.	Mar. 13, 1947
6.	Stainless steels.	Mar. 20, 1947
7.	Semisteel, Ni-Resist, alloy cast iron.	Mar. 27, 1947
8.	Factors governing cutter life, selecting feed rates.	Apr. 10, 1947
9.	Regulating life between grinds, cutter design.	Apr. 17, 1947
10.	Factors involved in good practice.	Apr. 24, 1947
11.	Tool grinding, reconditioning and blade setting.	May 8, 1947
12.	Converting to carbide milling.	May 15, 1947
13.	Planning carbide milling operations.	May 22, 1947
14.	Analyzing the workpiece, establishing feed rates.	June 5, 1947
15.	Rating carbide milling jobs.	June 12, 1947
16.	Rating carbide milling jobs (continued), selecting cutter size.	June 19, 1947
17.	Straddle milling v. face milling.	July 3, 1947

bination is as follows: Blades 1 and 8, 2 and 7, 3 and 6, and 4 and 5 are matched and operate on the same plane. Hence the feed rate is calculated on the basis of two teeth making a chip while the workpiece is moving into the cutter. Here a chip load of 0.020 in. is tentatively chosen; the feed per revolution is  $2 \times 0.020$  in. or 0.040 in. If the rpm of the spindle is 150, then the feed rate is 0.040 in.  $\times$  150, or 6 ipm.

Actually, the feed rate was arrived at the other way around—and properly so. After deciding on a restricted 10 cu in. per min of metal removal, the feed rate is calculated by dividing the 10 by the cross-sectional area of 1.75 sq in. The result is a rate of approx. 6 ipm. The chip load is then  $6 \div 2 \div 150$  or 0.020 in.

This feed rate of 6 ipm is not more than 20 pct greater than with high speed steel. But the operation is justifiably converted to carbide, since among other reasons, the full depth of 0.250 in. can be taken in one pass; this is not possible with high speed steel cutters since the resulting vibration is damaging to cutter life as well as to the machine quill.

The subsidiary, though worthwhile, advantages of the conversion are: (1) Dry operation; what this means is appreciated from an inspection of fig. 82; (2) greatly reduced grinding cost; the time for grinding a set of these blades, off hand on a pedestal grinder is 20 min; their setting in the body requires less than 10 min. This is compared with 2 hr at least for the grinding of a cutter of traditional design and cutting elements. The actual reduction in reconditioning costs, according to the cost records, is 75 pct

which takes into account all of the factors involved. Since this is a production job, this item of tool reconditioning cost is not only worth considering but necessarily so if the full and complete story of costs is to be revealed.

### Savings Through Adequate Equipment

At this point it is interesting to consider the overall saving for this one operation if adequate equipment were available.

Assuming the specification of a satisfactorily designed machine tool, bed or planer-type design, with a 50 hp spindle, and a fixture made available that permits bringing the frame close to cutter, then a K-factor for this boiler plate of 0.4 can be safely and conservatively assumed. In fact, test cuts taken with equipment similar to this and considered suitable indicate that this material can be milled at even a lower figure. Much depends on the design of the fixture and the resulting rigidity.

The K-factor is now 0.4; the amount of metal that can be used by applying all of the 50 hp to this job is 125 cu in. per min.

The sfpm rate can now be jumped to 750 which is extremely conservative for this material on the basis of actual experience. The highest rate of 900 sfpm can be used; but to prevent and preclude objections, the lower rate of 750, still within the range of good milling practice, will be used.

A 10-in. diam ten-tooth cutter is now specified to mill the 7-in. wide surface. The cutting and clearance angles are important: In the operation shown here and which is actually being used until more suitable equipment is available, negative cutting angles are specified. This seems necessary because of the inherent lack of rigidity in this setup as evidenced by the relatively high K-factor. But with a bed-type machine as considered in this discussion, the positive angles can be specified, that is, 10° positive radial rake and 7° negative axial rake, which in conjunction with a 15° nose angle results in a true rake of a positive 8°. While the cutting action is little changed, the effect of the positive angles on chip formation and disposal is superior, it seems, to that of the negative angles. More important, however, is the determination of the clearance angles = 7° on the periphery without land and 15° on the face without land. These latter angles are most important and if respectable cutter life is to be enjoyed, then these clearance angles are to be considered as a must.

The feed rate of the 10-in. face mill operating at a removal rate of 125 cu in. per min and working on a sectional cut area of 1.75 sq in. is  $125 \div 1.75$  or approx 70 ipm. Milling machines with 50 hp spindles are now equipped with a top feed of 90 ipm. Hence the 70 in. rate determined here is not impossible from the machine tool designer's standpoint.

This low carbon steel (somewhere between 8 and 15 points of carbon) will now be moved off at the rate of 125 cu in. per min instead of 10; the feed rate will be 70 instead of 6 ipm, and the cutting time will be 1 min instead of 12.

*Part 19 of this series on carbide milling will appear in the next issue.—Ed.*

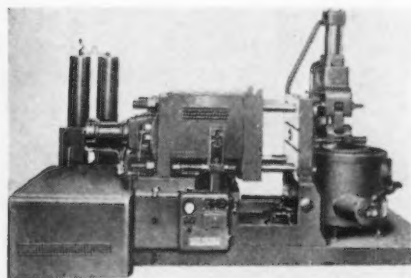


# New Equipment...

**A diecasting machine, multiple drill, power press brake, contour cutter sharpener, combustion and heat treating furnaces, and several machine tool accessories including a high-speed drill press, an air tracer for lathes, and a thread rolling attachment are described herein. Also featured are a rod cutter, tube support stands and a vacuum cleaner and blower.**

## Diecasting Machine

**A**NNOUNCEMENT of the No. 2 machine designed for diecasting of lead, tin or zinc base alloys and offering a large casting area with die plates 38 x 36 in. and space between bars 24 x 24 in., has been made by *Reed-Prentice Corp.*, Worcester 4. Sixteen pounds of zinc may be cast at 1400 psi pressure. The operation of the machine is either manual or semiautomatic. For semiautomatic operation, dies are closed manually by the push buttons on control panel after which the remainder of the cycle is automatic and controlled by an adjustable electric timing device. When manually operated, the four push buttons on the control panel are used. The machine is electrically

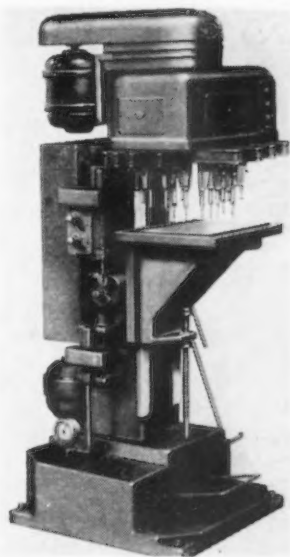


interlocked, eliminating danger of shooting the metal until the dies are securely closed. Arrangements are made for automatic ejection of castings. Die plates are finished on sides to provide for core pulling attachment and a push button operated control valve actuates core pulling cylinders when they are used.

## Multiple Drill

**M**ODELS A-33A and A-33B small multi-drilling and tapping machines have been announced by the *National Automatic Tool Co.*, Richmond, Ind. These machines have been designed for high-speed production of small holes on light work. Three feed ar-

rangements are available; hand and foot feed or combination hand and foot and air-oil feed for the A-33A which is equipped for both drilling and tapping, and air feed for the A-33B, suitable for light precision tapping. Spindle arrangement may be changed and reset to each par-



ticular job application with speeds changed by arranging pulleys on the sheave at the top of the machine. The head is bored for 10 spindles and spindle speeds are available from 650 to 3550 rpm, sheave arrangement providing 10 speed variations. The feed of the table of Model A-33B travels 2 1/2 in. max as compared with 4 in. max feed on the A-33A machine. Motors are available for 110, 200 and 440 v, 60 cycles, 30 phase ac.

## Turret Lathe

**A** 15-IN. electro-cycle turret lathe which replaces manual operation with automatic and reduces handling time for nonferrous metals to a consistent minimum, has been developed by *Warner & Swasey Co.*, Carnegie Ave., Cleveland 3. As the ram is mechanically

coordinated with each face of the hexagonal turret, the spindle automatically starts, stops, reverses or changes speed for threading in any order desired whether the turret indexes forward, backward or skip indexes. Current lathe tooling can be transferred directly to the electro-cycle which in one case is said to have increased production by 53 pct. Five attachments are available including horizontal forming slides, cross slides and a collet chuck booster for the electro-cycle which has a 1 1/2-in. bar capacity and a 16 7/8 in. chucking swing.

## Power Press Brake

**A** MOTOR-DRIVEN slide adjustment with both motor and controls readily accessible is a fea-

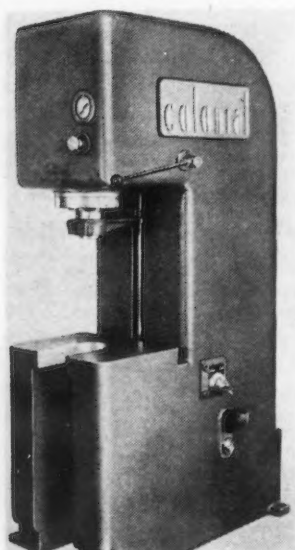


ture of the power press brake produced by *Columbia Machinery & Engineering Corp.*, Hamilton, Ohio. This slide can be adjusted out of parallel with the base, the magnitude of the adjustment showing on indicators located on each end. The brake is operated by a multiple disk friction clutch of special design and a friction brake. The slide and base have been designed for strength and rigidity with a maximum permissible deflection of 0.001 ipf of machine width. The brake is of 120 tons capacity and operates at a speed of 30 strokes per min. It will form mild steel in the following

sizes: 7/16 in. x 4 ft, 5/16 in. x 6 ft, 1/4 in. x 8 ft and 3/16 in. x 10 ft. The brake is furnished with a flywheel for belt drive but can be furnished for individual motor drive with a 10 hp 1800 rpm high torque high slip motor and completely enclosed V-belt drive.

### 10-ton Assembly Press

HAVING a maximum adjustable stroke of 12 in. and a power stroke speed of 180 ipm with a return stroke of twice that amount, a 10-ton hydraulically operated assembly press has been added to the line of assembly presses manufactured by the *Colonial Broach Co.*, Harper Station, Detroit 13. Ram speeds are adjustable over a wide range, however. Working pressure is 1200 psi max

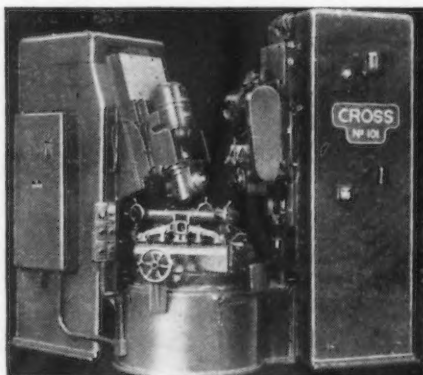


and is adjustable to any amount below this. Desired pressure can be selected and maintained exactly through a direct reading pressure gage adjacent to the pressure control regulator. The machine is compact, requiring only 25 x 42-in. floor space and is operated through a 7½ hp motor. Standard equipment includes hand operating control and pressure gage; foot pedal control is available as extra equipment.

### Special Milling Machine

A SPECIAL machine tool, for milling the tail pipe flange and intake manifold joint face on exhaust manifolds, has been designed and built by the *Cross Co.*, 3250 Bellevue Ave., Detroit. The

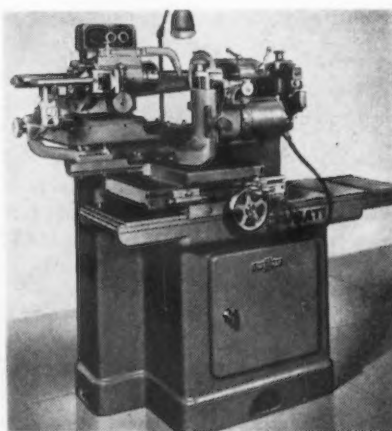
operation requires an angular vertical feed for the first cutting station and a box-type feed motion for the second one. Production is



rated at 110 pieces per hr. The machine is of the three-station power indexing type, the first station used for loading and unloading the work, the second for milling the tail pipe connection, and the third for milling the intake manifold joint face. Work at all three stations goes on simultaneously so that one manifold is completed with each index. All control, except work clamping, is by push button.

### Contour Cutter Sharpener

A MACHINE for the sharpening of contour-ground form milling cutters has been announced by the *Cincinnati Milling Machine Co.*, Cincinnati 9. Cutters are sharpened by grinding on the formed profile of the cutting edge instead of the flat rake face of the tooth. It is said that the life of form relieved cutters can be pro-

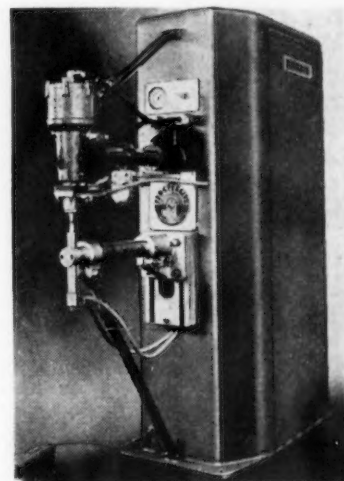


longed by contour sharpening after teeth have become too thin for further sharpening on the face. This machine generates contours

on the cutter teeth by accurately duplicating a metal master template of the desired shape. Convex or concave radii, angular faces, and combinations of these elements may all be produced with ease and accuracy it is claimed. Tracing action of the machine in following the master template is hand controlled. The wheelhead unit is carried on an antifriction type of mounting which provides free longitudinal, transverse, and swivel movements. The base of the wheelhead carries a follower pin which is held in contact with the template as the grinding wheel is guided along the tooth being sharpened. A vertical positioning slide is provided for grinding clearance or back-off angles.

### Spot Welders

DESIGNATED "economy" type machines, an improved line of 30, 50 and 75 kva pedestal type



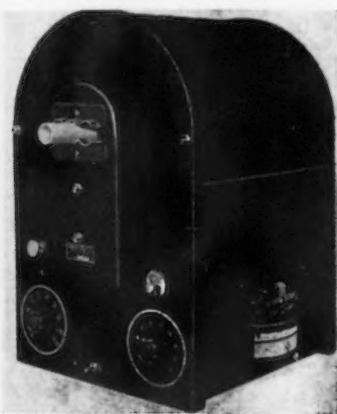
spotwelding machines has been introduced by *Progressive Welder Co.*, 3050 E. Outer Drive, Detroit. Frame construction in these machines is said to compare favorably with that of more costly heavy duty machines. By concentrating heavy construction in the frame at the front where rigidity is needed, it has been possible to use a light sheet metal construction for the rear of the machine. The machines are designed to provide both adaptability for job welding runs and high output rates. To facilitate miscellaneous spotwelding, knees are quick-adjustable, maximum stroke is 2½ in. and different types of interchangeable electrode holders are available. Correct pressure regulation is provided by a pressure gage at the front in the head



of the machine. Air filter and air system lubricator are standard equipment. Welding arms are of large diameter extending the frame rigidity right to the electrode point. Throat opening ranges up to 12½ in.

### Combustion Furnace

**T**HE Varitemp combustion furnace, with an electronic automatic temperature controller, has been made available to the industry by the *Harry W. Dietert Co.*, Detroit 4. This laboratory combustion furnace has been designed for the combustion of test samples for either carbon or sulfur determination in inorganic or organic materials.



Combustion temperatures are maintained within 3 pct at any selected temperature up to 2700°F.

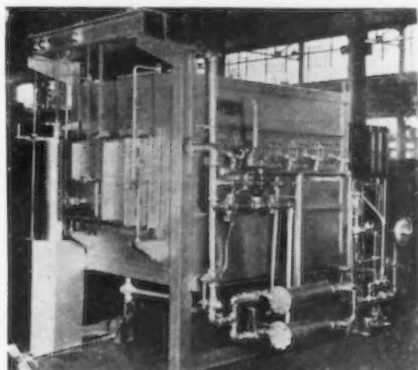
### Electric Pot Furnace

**D**ESIGNATED Model PF-2121, a new type electric pot furnace which is equipped to provide accurate heat control necessary in developing the finest physical and chemical properties in melting of aluminum, brass and bronze has been announced by the *Pereny Equipment Co.*, Columbus, Ohio. Design allows for ladling molten metal directly from the unit into diecasting machines, or to remove the crucible with tongs. A working capacity of 275 lb in aluminum (Tercod crucible No. 300 or equal) is said to be possible. Size of the new unit is 49¾ in. wide, 37¼ in. deep x 44⅓ in. high. Maximum power input is rated at 34.3 kw.

### Atmosphere Furnaces

**A**DDITION of the Balco atmosphere furnace and the Balco gas carburizing furnace to its

line of heat treating furnaces has been announced by the *Surface Combustion Corp.*, Toledo 1. Both furnaces utilize Surface RX gas as the protective atmosphere. A characteristic of RX gas in addition to being nonoxidizing is that



its carbon potential can be accurately controlled, it is said, to be in perfect balance with a desired carbon content of steel, making it possible to obtain a scale free, heat treated product with a selected surface carbon content. Balco atmosphere furnaces are of the horizontal muffle type, externally fired, with the RX generator built as an integral, but separately heated, part of the unit. They are of two general types: superheat, 2000° to 2400° and general heat treat, 1400° to 1850°F. The carburizing furnaces may also be used for heat treating all types of steel in a balanced carbon atmosphere, as well as for gas carburizing.

### Lathe Attachment

**H**IGH production of even small numbers of parts can be achieved, it is said, with the air



tracer, a device developed by the *Monarch Machine Tool Co.*, Sidney, Ohio, for application to the company's regular Toolmaker and Engine lathes. Hydraulically-operated, the mechanism guides the motion of

the standard lathe cutting tool in strict conformity with a master template of the finished piece.

### High-Speed Drill Press

**K**NOWN as the Drill Speeder, a self-contained high-speed electric drill that fits into the chuck of any standard drill press, lathe, milling machine or specially designed machines and fixtures, has been announced by the *Dumore Co.*, Racine, Wis. Equipped with ⅜-in. straight shank or No. 2 Morse taper shank, the Drill Speeder supplies its own power, 1/16 hp, and 17,000 rpm for drills from No. 8 up to ⅜-in. diam. Jacobs chuck and motor parts are accurately balanced



so that small hole drilling can be performed at high speed with drill breakage reduced to a minimum, it is reported. The drill also provides quick setup for small production drilling jobs.

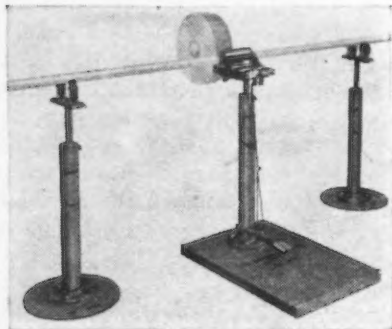
### Vacuum Cleaner and Blower

**A**N improved model of the Toronado portable industrial vacuum cleaner has been announced by the *Breuer Electric Mfg. Co.*, 5100 N. Ravenwood Ave., Chicago 40. The motor-fan unit of the cleaner can be removed to become a portable blower capable of delivering clean, dry air moving at the rate of 295 mph, it is said, for removing dust, dirt, and sticky fuzz from motors, generators, shafting and similar equipment with hard-to-clean places which accumulate dirt. With the motor fan in place, the unit operates as a suction cleaner. Light dust is accumulated in a bag outside the tank while heavy dirt, scraps and metal par-

ticles move directly into a 12-gal steel tank, by-passing the suction fan to prevent injury to moving parts.

### Tube Support Stands

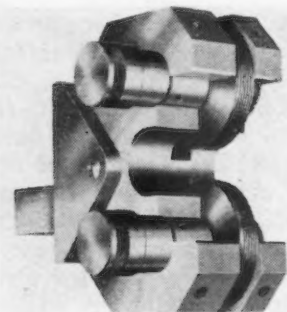
**M**ORE uniform polishing and efficient handling of long tubing on semiautomatic tube



polishing machines is said to be afforded by the Presto tube support stands developed by the *Manderscheid Co.*, 810 Fulton St., Chicago 7. Tubing rests on two rubber wheels, located on top of the stand. By adjusting the angle of the wheels, the movement of the tubing across the polishing wheel or abrasive belt can be regulated to the required speed. The stands are designed to hold tubing from  $\frac{3}{4}$  to 5 in. in diam and are adjustable from 28 to 38 in. high.

### Thread Rolling Attachment

**F**OR rolling straight threads on automatic screw machines and turret lathes, an attachment has been developed by *Landis Machine Co.*, Waynesboro, Pa. The attachment is designed for application to practically all standard makes of automatic screw machines and turret lathes. This attachment provides for processing threads which

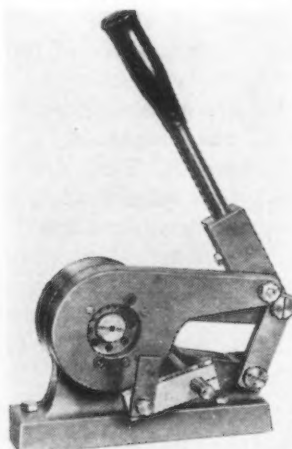


otherwise would have to be handled as a secondary operation, as a result of shoulder interference or inaccessible positions for die head threading in the normal manner.

It is claimed that completing the work on the same chucking provides closer tolerance between the thread and other sections of the workpiece.

### Rod Cutter

**K**NOWN as the Di-Arco rod parter, a cutter employing a "parting-off" method has been produced by the *O'Neil-Irwin Mfg. Co.*, Lake City, Minn. This precision unit is offered in two sizes with capacities ranging from  $\frac{1}{32}$  to  $\frac{3}{8}$ -in. and  $\frac{1}{16}$  to  $\frac{5}{8}$ -in. cold-rolled steel bars. It is said the rod parter accurately cuts off round materials without distortion, on a production basis. A powerful multiple leverage arrangement provides ease of operation, it is claimed, and very close tolerances as to length, squareness and concentricity can be maintained in extremely small diameter rods in various materials as well as in larger diameter materials. The ma-

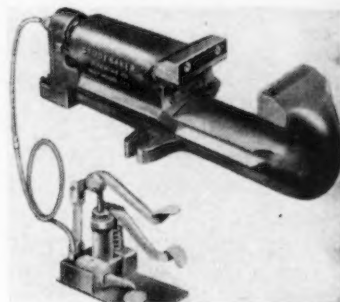


chine can be used also for many types of plastics, fiber, rubber, wood and bimetal as well as stainless steel, chrome molybdenum, copper, aluminum, etc., it is reported.

### Hydraulic Vises

**T**WO foot-operated hydraulic Speedvises built with V ways and gibs have been announced by the *Studebaker Machine Co.*, 1221 S. 9th Ave., Maywood, Ill. Elimination of hinging action under pressure and adjustment for wear is effected by built in gibs of high grade steel set at  $45^\circ$  angle in V ways of semisteel. Speedvises are self-contained requiring no outside

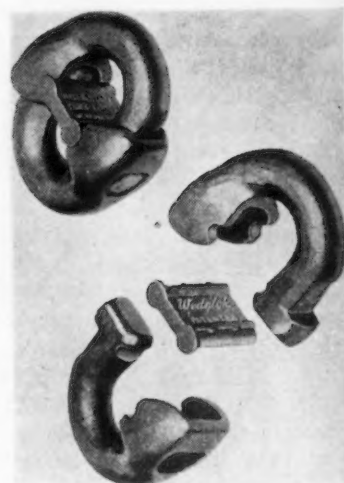
power source. Pressures from a feather touch to a  $7\frac{1}{2}$ -ton squeeze can be built up with a few strokes of the hydraulic pump unit and jaw action can be controlled from very fast to very slow, it is said. Two models are available: No. 750 Tor-



pedo having  $7\frac{1}{2}$ -in. max opening between jaws and  $7\frac{1}{2}$ -ton max jaw pressure and No. 500 Bullet having 5 in. max opening and 5-ton max jaw pressure.

### Connecting Link

**F**OR operations in which on-the-spot replacement of links is important, the *Interstate Drop Forge Co.*, 4053 N. 27th St., Milwaukee 9, has announced an improved connecting link, called the Wedglok, which is produced in sizes from  $\frac{3}{8}$  to  $1\frac{1}{2}$  in. and features, in addition to its safety, simplicity in assembly. It consists of three parts designed for rapid assembly without the use of special equipment. Links are produced in both regular



shape and pear shape, their tensile strength said to exceed the published strengths of comparable alloy chain.



# MESTA FORGED HARDENED STEEL WORKING ROLLS

*for Cold Mills*



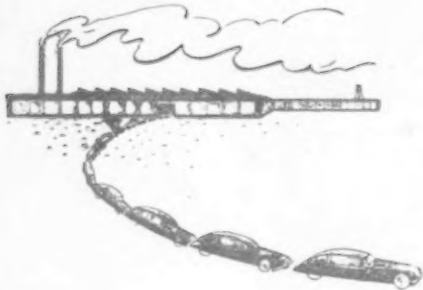
Finishing a 21" x 98" Mesta Forged Hardened Steel Working Roll, for use in modern high speed Cold Reduction Mills as shown above, in a Mesta 28" Travelling Table Type Roll Grinder.

MESTA MACHINE COMPANY · PITTSBURGH, PA.

# Assembly Line . . .

WALTER G. PATTON

• Auto production made uncertain by the recent threat of a coal strike . . .  
New car bootlegging is destined to continue . . .  
Auto engineers holding many new developments under wraps.



**D**ETROIT—The automobile industry will remember the week starting June 30, 1947 as a period filled with more anxiety and frustration than any previous period during the year.

Reports were coming in that steel plants and blast furnaces were being closed down throughout the country. Past experience has shown that even the temporary clogging of steel supply lines would be followed inevitably by shutdowns of auto assembly plants. Even before the threat of a coal strike became serious, all the division of Chrysler and Nash were shut down for lack of flat-rolled steel. Other producers were reported to be on the ragged edge so far as steel supply is concerned. This was the situation that developed as a result of a mere threat to pull out the miners plus sporadic walkouts in captive mines.

Now that the threat of a coal strike is removed, the auto industry is again breathing easier. With only a few exceptions automobile executives can again see continuous production ahead. But the problem of badly balanced steel inventories still confronts the industry, and if the brief interruptions to steel deliveries happened to hit a vulnerable point along the steel supply lines that feed Detroit's au-

tomobile plants, the plants will go down and production will come to a halt while steel stockpiles are again built up.

The plans of the auto workers in meeting the restrictions of the Taft-Hartley bill have not yet been made clear. However, if past experience can be relied upon the obstructions that will be raised against the new legislation will be formidable and well conceived.

Few Detroit industrialists could be found this week who would comment, either on or off-the-record on the new labor bill. Management's policy seemed to be one of "watchful waiting" while union strategists mobilized their legal forces to resist to the limit the new legislative handcuffs placed on union leaders.

**A**DDING to uncertainty about the industry's labor picture was the fact that the Michigan state legislature has just passed the most stringent restrictions on labor in the state's history. (See P. 76.)

The cost to strike in Michigan will undoubtedly be raised by the new Bonine-Tripp bill. However, those who are best qualified to judge the temper and resourcefulness of labor leaders here still preferred to "wait and see" rather than predict the future actions of Michigan's vigorous and often militant labor unions.

One thing seemed reasonably certain—weeks in which 100,000 or more cars will be assembled appeared out of the question for a month at least. Predictions about auto production of 400,000 units in July were knocked into a cocked hat. The possibilities of a 5 million car year in 1947, if not eliminated, were certainly overshadowed by the restrictions in the flow of steel into Detroit resulting from the threatened coal tie-up.

Long week-ends by industrial plants including the July 4 holiday will limit further the output of cars this week bringing added disappointment to the long lines of customers still waiting to receive a new Chevrolet, Ford, Plymouth or Cadillac. Most car makers with the

possible exception of Kaiser-Frazer and Hudson still had lots of customers on the books—an inevitable situation as long as new cars continue to sell on used car lots for as much as \$1000 over the dealers' price.

Most sources here predicted that legislative attempts to stop new car bootlegging would, at best, act as a deterrent rather than a cure for price high-jacking of new cars. There is only one cure for the disease that has now infected the industry on a large scale, auto sales executives were saying, and that is more production. As C. E. Wilson, president of General Motors expressed it: as long as the industry offers a \$10 product for \$8, profiteering in new cars is inevitable.

In that event auto bootlegging will be with the industry for some time to come. Real relief is nowhere in sight.

**T**HERE was a brighter side of the auto picture, however.

Engineering progress by the industry has undoubtedly surpassed by a fair margin public knowledge of the industry's accomplishments. Under cover of night a 1949 model car—not the 1948 version—was recently driven into Detroit and one auto engineer who has seen it was greatly surprised with the engineering progress that has been made in the new car.

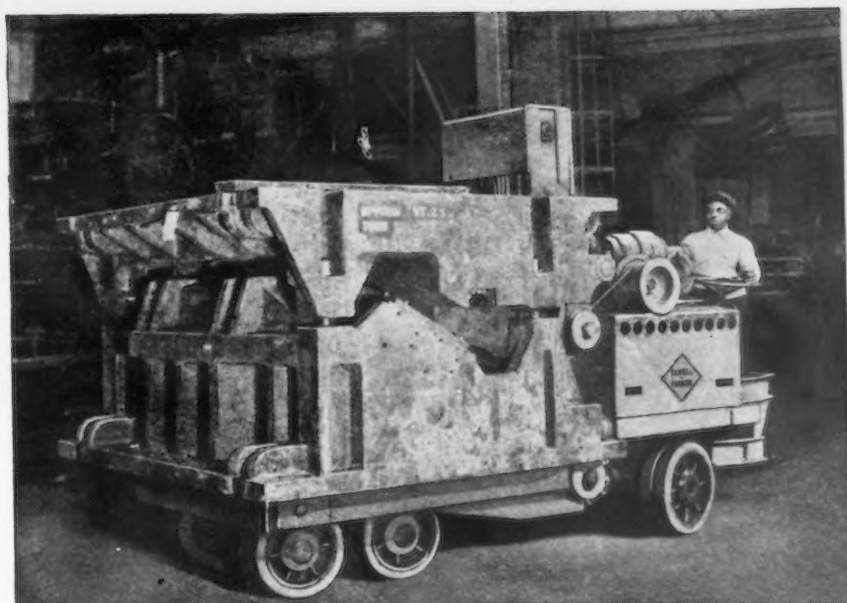
Although details of the new car design cannot be divulged, it is generally accepted that high compression engines, automatic transmissions and new types of springing are at the top of the engineering lists of accomplishments. Body design appears to be leaning at the moment definitely in the direction of the Studebaker styling.

There is more than a possibility that at least three GM divisions will have new V-type engines with much shorter crankshafts than the present models. Ford is reported to have a greatly modified engine, having advantages both as to performance and cost of production. The fact that Ford has always been up front in conceiving new



# SUPER STRENGTH

Another Reason Why  
**ELWELL-PARKERS** are preferred!



**T**HE "tank-tough" construction that characterizes Elwell-Parker trucks, tractors and cranes pays off in longer life and minimum maintenance costs. Here are a few reasons why so many Elwell-Parkers are "still going strong" after 20 years of service:


**MODERN MATERIALS, PROPERLY PROCESSED—**

Elwell-Parker makes generous use of alloy steels — chrome, molybdenum and nickel — wherever greater wear is encountered. On vital parts, drop forgings are used more extensively than in the average truck. E-P heat treating is thorough—often involving double or triple firing.

**EXTRA RUGGED FRAMES—**They have the true ring of one solid piece because they are durably welded and riveted into a unit of heavy gauge plate by Elwell-Parker craftsmen.

**STRONGER MOTORS—**They are E-P built, Class B type, practically indestructible and fire proof. Because these motors have more copper, greater commutator area, plus more brushes than usual, they easily absorb all the power that can be delivered to them.

**UNIQUE ENGINEERING—**Because Elwell-Parker engineers have had longer experience, they fully recognize the abuse and overload factor. Consequently, you find *surplus* strength wherever needed; for example: double stabilizing tilt racks, overload slip clutches, no fuses, and a new, high-speed travel controller.

For further evidence regarding the strength of these trucks, plus their proper application to your specific needs, call in the nearest  man. The Elwell-Parker Electric Co., 4225 St. Clair Avenue, Cleveland 14, Ohio.

## ELWELL-PARKER

**POWER INDUSTRIAL TRUCKS**

Established 1893

ways to build things better and at lower cost gave added credence to the report.

In July 1947 the auto industry was like a small boy who had a new suit of clothes just about ready to be delivered by the tailor, but he couldn't wear the new suit just yet. There were many "fittings" that had to be made. And there was uncertainty about whether enough materials would be available to produce other suits from the same pattern.

In midsummer 1947 the auto engineers seemed to be much closer to their goal than the U. S. economy and the plant production men.

### Michigan's Governor Signs Stringent Labor Bill Despite Protests

Detroit

• • • The most stringent labor legislation in Michigan's history has been signed by Governor Sigler despite strong protests by the state's labor leaders.

Effective Oct. 12 the Bonine-Tripp labor bill places the state in charge of strike votes in industry. Jurisdictional strikes are outlawed and arbitration becomes compulsory in the event of labor disputes involving public utilities.

Under the terms of the bill a 10-day notice must be filed with the state labor mediation board before a strike or lockout can be called. A

When the engineers dream cars would hit the road was still anybody's guess but the fact that some auto builders are having die try-outs indicate that the introduction of new models is definitely closer at hand than it was a few months ago.

If not enough steel came into Detroit to maintain present production schedules it might be better to shut down completely and build up steel inventories, some of which could certainly be used for new models. This was only a speculative view of the situation. But it might easily be along the same lines as some of the industry's thinking.

30-day notice is required in public utility disputes.

Where mediation fails to settle a dispute the state board is required to conduct a strike vote with the employer's last offer printed on the ballot. Approval of a majority of all employees in a bargaining unit rather than a majority of employees voting is necessary to call a strike.

Strikes of public utility employees are banned under the bill which provides for compulsory arbitration by a 3-man board. Where the employer and the union fail to agree on a third person, the presiding circuit court judge of the state is empowered under the law to select a circuit judge to sit as chairman of the board of arbitration.

Penalties of \$1000 fine or 6

months' imprisonment or both are provided for persons who instigate or are otherwise found responsible for illegal work stoppages.

The law also outlaws picketing of residences of persons connected with labor disputes.

Where jurisdictional labor disputes occur, the unions involved are compelled to agree to a representation election to be conducted under the supervision of the state board. Either the employer or employees may request such an election.

The cost of strike votes is to be borne equally by employers and the union, except in the case of jurisdictional disputes where the entire cost of the strike vote is to be assessed against the unions involved.

Injunctions may be issued by circuit courts even though all sections of the law have been complied with if the court finds that a strike endangers the "public welfare, peace, health or safety."

Walter Reuther, UAW-CIO president has objected that the election cost provisions of the bill will drain the treasuries of many unions. The UAW-CIO union promised to test the validity of the new measure in the courts.

### Reports Membership In AFA Reached New Record High of 9683

Chicago

• • • Membership in American Foundrymen's Assn. reached a new all-time high of 9683 on July 1, William W. Maloney, AFA secretary-treasurer, has announced. The record figure represents a gain of 1144, more than 13 pct over the total a year earlier.

On July 1, more than 8800 members were affiliated with AFA chapters in the United States, Canada and Mexico. The membership roll, on that date, showed 430 members outside North America. Representation in the society, Mr. Maloney pointed out, now extends to every major foundry center on the continent, and to many abroad.

New chapters and their headquarters are British Columbia, Vancouver; central Michigan, Marshall; Rocky Mountains, Denver; Tri-State, Tulsa; and Washington, Seattle.

**BIG JEEP:** The latest unit in the Willys Overland utility line is this 4-wheel drive jeep truck. Powered by the regular jeep engine and weighing 5300 lb, the new truck will carry a 1-ton payload.





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*thanks to* **AJAX Liquid Carburizing Furnaces"**

**states WILLIAM F. SORENSON, Chief Metallurgist  
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"On all types of shaved gears we hold dimensions to .0008" or less . . . and get a remarkably *uniform case*. On high speed driving pinions and shafts, from 8 inches to 4 feet long, *selective liquid carburizing* of the two ends eliminates 80% of our straightening operations."

Reprints of technical articles on liquid carburizing, by Mr. Sorenson and others, will be sent on request. Complete information on AJAX Electric Salt Bath Furnaces and their many uses—neutral hardening, austempering, martempering, isothermal quenching, hardening, annealing, brazing, tempering, cleaning, etc.—is contained in the new 72-page Booklet #116. A copy will be sent any metallurgist or metalworking executive writing for it on his firm's letterhead.

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HULTGREN

**ELECTRIC SALT BATH FURNACES**

• Code of ethics suggested for duration of steel shortage . . . Export program under study . . . Lodge-Brown Bill expected to bring government efficiency, vast savings.



**W**ASHINGTON—On the lookout for a workable solution by which steel may be shut off from the gray market and the scarcer categories distributed in the fairest way possible, the Martin Steel Subcommittee of the Senate Small Business Committee is more than a little interested in the 5-point program advanced by President Frank R. Nichols of the Nichols Wire & Steel Co., Davenport, Iowa.

It is proposed by Mr. Nichols that the steel industry could set up a code—of such type as not to run counter to the anti-trust laws—by which he believes many of the inequities of the present situation could be done away with.

Specifically, he has suggested: That the industry agree to make no "tie-in" sales such as requiring scrap in exchange for finished or semifinished products; that in cooperation with the government, it determine the steel needs of the country and agree to make steel in the sizes and types needed in the most effective way possible; that steel be shipped into every territory where needed regardless of freight absorption and similar factors; that no producer accept subsidies or premium prices for export steel; and, that existing surplus ca-

pacities be converted to the utmost utilization for legitimate customers at legitimate prices.

The subcommittee is deeply interested in all such proposals or suggestions. Senator Martin has made it plain throughout the series of hearings—still far from completion—that his group is not on a witch hunt for evil doers but is trying to get at and remedy the underlying causes of the situation. While estimates as to the extent of the gray market have ranged from industry's 2 pct to the committee's 5 pct or more, the amount is conceded to be considerable.

Using a middle figure of 3 pct and taking an arbitrary 65 million tons as the output rate of finished steel, this would throw approximately 2 million tons or about \$150 million worth into the gray market. Setting \$200 as an average premium price, buyers forced into market are out a conservative quarter-billion above going prices—a large amount of steel and a lot of money.

**A** NUMBER of factors have been turned up by the Senate group as underlying causes. The primary one, of course, is the fact that there simply isn't enough steel to go around. Another is inequity of distribution and still another is the export program which has recently come under considerable criticism, within Congress and out. The Martin subcommittee is now probing deeply into this subject.

The United States policy definitely favors a large export program. With a worldwide famine in steel and the United States as the only "have" among a lot of "have not" countries, as to resources and productive capacity, there is little question as to its responsibility. It is highly debatable, however, as to what proportion should be channeled to foreign markets at the present time.

In this respect, Mr. Nichols offers an interesting comment. As already mentioned, he suggests that the mills should not charge foreign purchasers premium prices. Over and above other aspects, he believes this tends to rouse a resentment in the foreign buyer, a feeling that he has been gouged at a time when he couldn't help him-

self, and thus react unfavorably toward American industry when real competition once more sets in.

Personally, Mr. Nichols is opposed to premium payments of any kind, feeling that when any industry accepts government subsidies it "simply invites government control." Actually, of course, subsidization is a limited form of government control; that is the reason given by Mr. Nichols in returning to the RFC some \$3600 paid his firm for overquota wire nail production and for waving claims on additional \$4420 due but not paid.

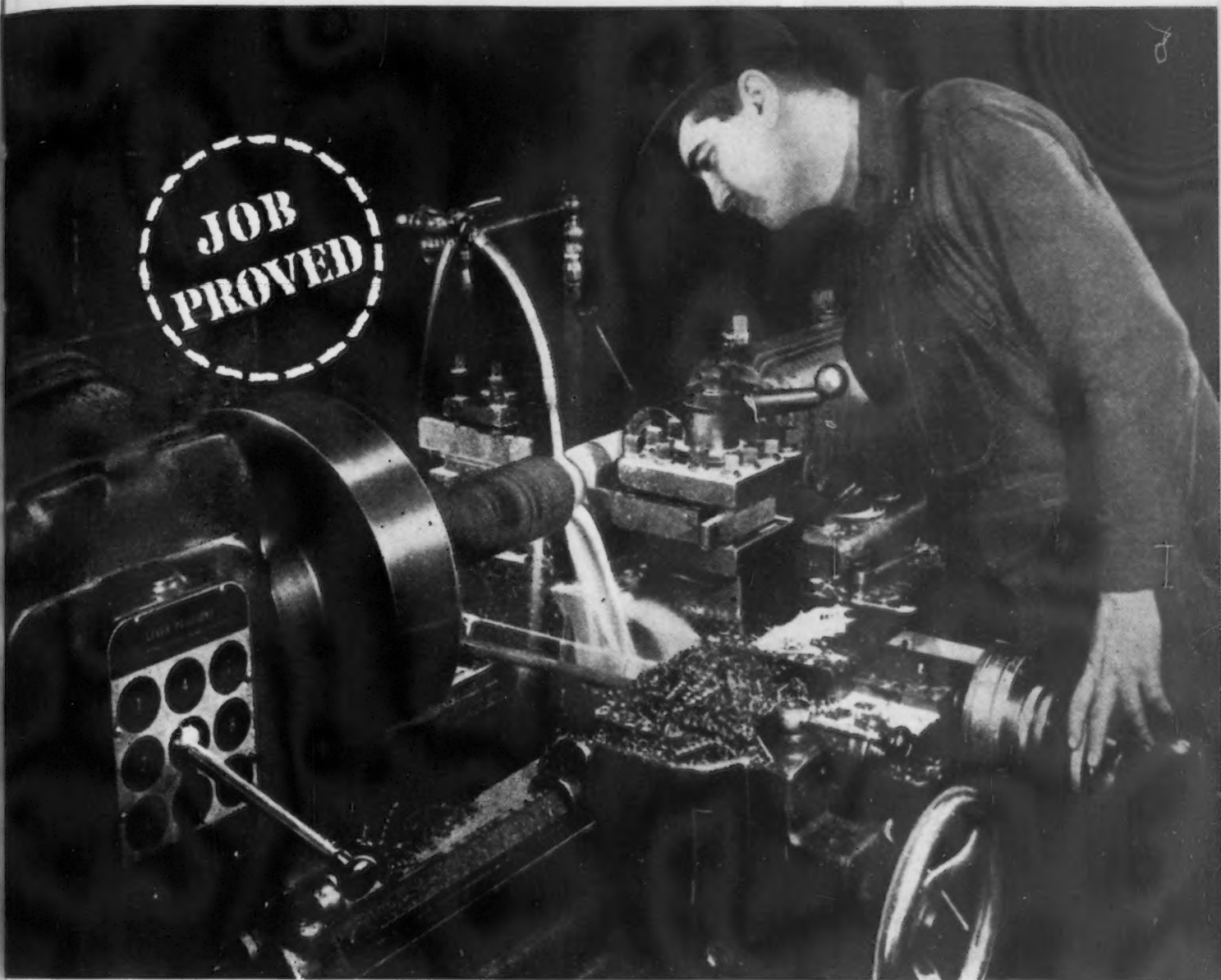
In view of the continuing tight domestic situation, the Marshall plan for foreign aid, and similar factors, exports are becoming a matter of increasing concern to Congress. Lacking time to work out all details on the bill continuing export-import controls past the June 30 expiration date, Congress extended by resolution all remaining restrictions until July 15. With adjournment date set tentatively for July 26, there is little doubt of final action which will continue controls for at least another year.

**R**EBUFFED in their efforts to pass a tax reduction measure which would be effective this year and far from their original goal of \$6 billion in budget cuts, the Republican majority is laying the groundwork for substantial tax and budget cuts in the fiscal years 1949 and 1950. House leaders claim to have slashed about \$4.5 billion from the President's 1948 budget of \$37.5 billion. However, actual savings will be about \$1 billion less than the amount now claimed, due to the fact that some of the cuts are reflected in such items as arbitrary slashes from the amount estimated for tax refunds during the current fiscal year. There is little doubt that deficiency appropriations will be necessary to cover such items as well as the budgets for such agencies as the Veterans' Administration and the Atomic Energy Commission.

In view of these facts, it might appear that any efforts to cut down government expenditures are doomed to failure. This is not the case, for there is a growing realization among the Republican majority that substantial savings



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in the executive branches of the government and resulting tax cuts will not be possible until the entire structure of government is overhauled from top to bottom.

With Presidential approval of the Lodge-Brown bill, a study of the reorganization of the executive branch will be gotten underway by a commission of experts who will report back to Congress by January 1949.

The legislators are cognizant of their ignorance of the byways of the overwhelming bureaucracy which has been built up over the past decade and equally aware of the fact that because of this situation their efforts to cut the government down to peacetime levels are, to say the least, procrustean.

Experts say that a thorough study of the type provided for in the Lodge-Brown bill will make possible savings of between \$7 billion and \$11 billion a year, resulting in enough leeway to provide for debt retirement as well as cuts in both corporate and personal tax levies.

The nonpartisan commission called for in the bill will consist of 12 members drawn from government, private life and Congress.

Approved without a dissenting

vote in either House, it represents an attempt to introduce modern management methods into the business of government. Obsolete legislation which forces government departments into extravagant and wasteful functions will also be a part of the study.

**T**HE need for such a study and subsequent reorganization of the executive branch is self-evident. Despite the discharge of some wartime employees, federal employment is still at an all-time high for nonwar periods. There is also a great duplication and overlapping of functions. This is due in large part to the philosophy that has prevailed for some years which holds that every new problem facing the nation can be solved by creating a new agency of government.

To illustrate the duplication of functions, Sen. Henry Cabot Lodge, Jr., R., Mass., co-sponsor of the streamlining act, recently presented figures revealing the existence of 29 agencies in the acquisition of land, 16 in wildlife preservation, 10 in government construction, 9 in credit and finance, 12 in home and community planning, 10 in materials and construction, 28 in welfare matters, 14 in forestry mat-

ters, 4 in bank examinations, and 65 in gathering statistics.

Much of the waste has also been due to the reluctance of pork-barrel legislators to cut appropriations in view of anguished cries from department heads that such cuts would curtail essential functions of the government, despite the fact that there has been little inquiry into what actually is essential. The Lodge-Brown bill provides for such an inquiry.

The outlook then is for substantial cuts in the fiscal year 1949 due to certain nonrecurring expenditures and congressional slashing of subsidies and some public works projects. By the time fiscal year 1950 rolls around the full effects of the Lodge-Brown bill will have been felt and the government should once again be on a sound financial basis, provided, of course, foreign aid programs do not result in higher taxes or deficit financing or a combination of both. In any case, the nonpartisan study of the functions of government should result in efficient practices within government, regardless of the financial problems confronting the nation.

## THE BULL OF THE WOODS

BY J. R. WILLIAMS



## Polish Coal to Austria In Exchange for Steel

Washington

••• Under a new trade agreement which becomes effective Aug. 1, Poland is committed to supplying Austria with approximately \$4 million worth of coal, the American Military Government has reported to the War Dept. In exchange, Austria will ship steel constructions, magnesite and varied metal manufactures to Poland.

At the same time, it was reported that Austria's allocation of Ruhr coal has been increased to 203,000 tons a month. Also, exploration work by American authorities has disclosed an estimated 24 million tons (metric) of visible brown coal reserves near the Wildshut Mine, all of which can be exploited by open-pit methods.

The War Dept. revealed that it has approved the transfer to Austria of up to \$50 million worth of equipment in the area which is surplus to the Army's needs.





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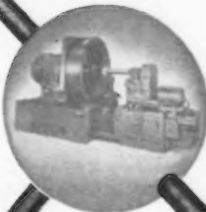
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• Survey reveals fate of shipbuilding industry which brought the first integrated steel plant to the West Coast and once was the mighty employer of more than half a million.



**S**AN FRANCISCO—Sired by Mars and born from the womb of necessity, the tin-hatted shipyard behemoth which swagged up and down the Pacific Coast for five years launching thousands of vessels to meet the demands of its parents, today lies on its deathbed.

Where, not so long ago, 100 men, women, boys and girls welded, riveted and lifted from dawn to dawn to build Libertys, C-3's, tankers and destroyers, now only ten remain and they only to repair or convert these same ships.

This giant industry which demanded steel in such unprecedented quantities that it brought the first completely integrated steel plant into being on the West Coast employed approximately 580,000 persons at the peak of its activity and today employs only 64,000.

Dissolution of this industry has left in its wake dozens of idle and deserted yards, many of which are still in government hands awaiting disposal. Some few of the yards are still in active operation with reduced payrolls, repairing ships, converting transports to luxury liners or reconditioning war-weary cargo ships for sale.

This is what is happening or has happened to some of the principal yards on the Coast:

## San Francisco Bay Area

*Kaiser Co., Inc.*, Richmond Yard 3: Approximately 500 men are engaged in scrapping ships averaging approximately 10,000 tons each and this activity is scheduled to continue at least until the expiration of the company's lease on Sept. 30 of this year. Same company, Yard 4: Now completely abandoned and in the hands of WAA, the property is being restored to the original owners, the Santa Fe Development Co.

*Permanente Metals Corp.*, Richmond, Yards 1 and 2: These yards are completely shut down and the WAA has received bids on the property from the City of Richmond, Parr Terminals and the Santa Fe Development Co.

The above four yards turned out 747 vessels of ten different types during their short life, and at their peak employed altogether approximately 93,000 persons.

*Moore Dry-dock Co.*, Oakland: Now employs 1900 on ship repair and conversion. Many of the latter jobs were on ships sold by our government to foreign countries and it is expected that this work will discontinue shortly as foreign conversion and construction facilities are rapidly being put into operating condition. The battleship *Oklahoma* which sank while being towed to this country from Hawaii was destined for scrapping at this yard. Company officials state that as soon as repair and conversion work is terminated they hope to get into the shipbreaking business. At present, 100 men are employed in their structural steel fabricating plant which has a capacity of approximately 500 tons per month. Peak employment during the war here was 36,000.

*Marin Shipbuilding Corp.*, Sausalito: During the war this yard produced tankers and is now completely inoperative with the property in the hands of the WAA for disposal. Part of the property is now under lease to the Western Ocean Div. of U. S. Army and six bidders, including the City of Sausalito, Clipper Yacht Co. and Cement Gun Co., are in the picture. The land only is being put up for sale and the Whirley cranes of approximately 60-ton capacity are to be sold sep-

arately as is other equipment. During the wartime peak 22,000 persons were on the payroll of this corporation which has since been dissolved.

*Bethlehem Steel Co.*, Shipbuilding Div., San Francisco: This company operates four West Coast ship repair yards. The largest presently operated ship repair yard in the United States is that in San Francisco which employs 2600 persons and is reportedly the oldest continuously operated shipyard in the country, having been started in 1884. During the war destroyers and cruisers were built here and operations now are confined to repair work. Employment reached a peak of 8600.

*Bethlehem-Alameda Shipyard, Inc.*, Alameda: The last two of ten Navy troopships built at this yard have been launched and are now being outfitted as luxury liners for the American President lines and are known as the *President Cleveland* and *President Wilson*. This yard is operated by Bethlehem for the U. S. Maritime Commission. Employment is now 2300 and during the war reached a peak of 10,000.

*Bethlehem Steel Co.*, Shipbuilding Div., Alameda Yard: This yard concentrated on repairs during the war and now employs 153 men repairing eight vessels which is approximately the peak capacity of this yard which has one 4500-ton floating drydock.

*Mare Island Naval Shipyard*, Vallejo: Approximately 10,500 civilians are employed at this yard at present on cruiser repairs and maintenance. Some new construction is being completed on submarines and some conversion and remodeling of other ships is under way. During the war 39,000 civilians were employed.

*San Francisco Naval Shipyard*, Hunters Point: Overhaul and repairs and the laying up of Navy vessels is being carried out here by 7500 civilian workmen and the employment ceiling for the last quarter of this year has been set at 7700 by the Bureau of Ships. Peak employment of civilians during the war was 18,300 in October, 1945.

*United Engineering Co., Ltd.*, Alameda: This yard now employs



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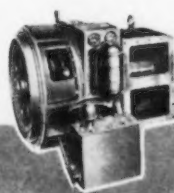
changing stream by day and by night, from upstream or down, in flood stage and dead-low water.

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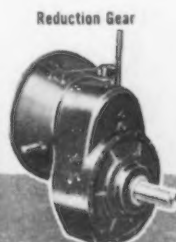
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**SPECIALISTS IN INDUSTRIAL CLUTCHES SINCE 1918**

3800 as against a wartime peak of 3300 and is engaged in converting the *SS Lurline* and the *SS Monterey* back into pleasure cruisers. The San Francisco pier and shop of this company is now employing 2500 men as against a wartime peak of 4000 and is also engaged in repair and conversion.

**Western Pipe & Steel So.,** South San Francisco: Ship work of all types has been abandoned at this yard which, during the war, built cargo ships and employed 12,000 persons.

#### Portland, Oregon Area

**Kaiser Co., Inc.,** Swan Island: This yard, a mighty producer of ships during the war, is in the hands of WAA and negotiations are now in progress between this body and the Port of Portland for the repossession by the latter of the shipbuilding site which is government leased until 1952. The city hopes to gain possession of this property so that it may be subleased for industrial purposes. Dulien Steel Products, Inc. and Barde Steel Co. had submitted a bid for the property to be used for shipbreaking. The Kaiser interests had continued to operate this yard until recently with as many as 1400 persons on the payroll and the Dulien-Barde combine had offered to permit the Kaiser organization to continue occupancy on the same basis as had been in effect.

**Oregon Shipbuilding Corp.:** The Kaiser interests operating this yard completed its last ship in the middle of May and the property is now in the hands of WAA for disposal. The site is jointly owned by the government and the Kaiser interests. The Commissioner of Public Docks is reported as pressing for city ownership of the buildings which would be converted into a lumber terminal. The unimproved portion would be offered for general industry development. During the war the above three yards employed 110,000.

**Kaiser Co., Inc.,** Vancouver, Wash.: This property, on which all operations have been suspended, is being held in status quo by the Maritime Commission for reactivation in the event of some unforeseen emergency.

**Commercial Iron Works,** Portland: WAA is making an effort to dispose of this property, a part of which is presently being used by Zidell Machinery & Supply Co. as a ship dismantling base. Six baby flattops are being dismantled and the possibility exists that other wartime vessels may be brought to this port for the same purpose. Oregon steel mills here form the principal outlet for the scrap.

**Willamette Iron & Steel Co.,** Portland: The part of this property used for wartime shipbuilding is being offered for sale by the WAA. The company's old line business on

a part of the same site, consisting of manufacture of logging and saw mill machinery, is being continued.

**Northwest Marine Iron Works,** Portland: Minor ship repairs are being carried on at this yard.

**Albina Engine & Machine Works,** Portland: Minor repair work is being continued at this yard.

**Gunderson Bros.,** Portland: Manufacture of fishing craft continues to be the major activity. The company is presently engaged in the construction of a new tug for the Port of Portland.

During the war more than 1200 major vessels, such as tankers, troop transports, Liberty and Victory ships, were produced by Portland's eight shipyards.

#### Puget Sound Area

**Puget Sound Naval Shipyard,** Bremerton, Wash.: With a payroll of 9000 workers, which is higher than at any time during the pre-war period, the yard is engaged in repairs and ship modification and is expected to play an important part in the Pacific fleet program for the next few years.

**Todd-Pacific Shipyards, Inc.,** Tacoma: This company maintained two large yards in Seattle and a third was in operation at Tacoma. Today the Tacoma yard is back in the hands of the U. S. Navy and is being used as a storage area. In return for Todd's interest in the Tacoma yard, the Navy gave up most of its interests in one of the Seattle yards. These two Seattle yards now operate as a unit under the name of Todd Shipyards Corp., one yard being used for construction and the other for repair work. The company owns the latter outright, and has a part interest in the construction yard and leases the remaining facilities from the Navy.

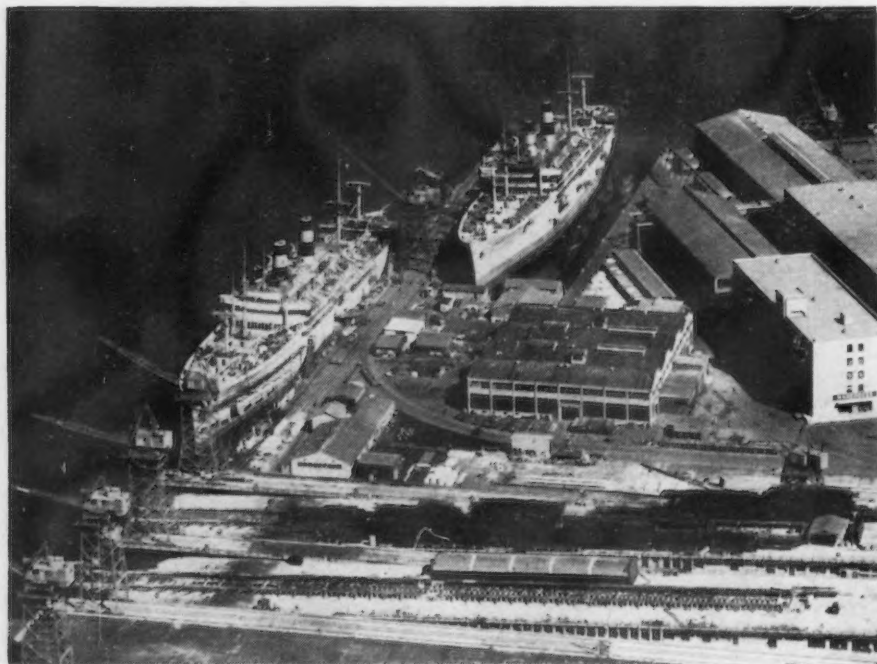
The construction yard is closed with the completion of a large ferryboat. The repair yard has 2500 persons employed repairing Army, Maritime Commission and privately-owned ships.

**Everett-Pacific Shipbuilding & Drydock Co.,** Everett: This yard was built by the government during the war and its equipment includes a 10,000-ton drydock where repair work is being carried out by approximately 1000 employees.

**Puget Sound Bridge & Dredging Co.,** operated a large yard on Harbor Island under the name of Associated Shipbuilders. In addition,

(CONTINUED ON PAGE 113)

**TWO PRESIDENTS:** Among the handful of ships under construction in U. S. shipyards are these two luxury liners, the "President Cleveland" (left) and the "President Wilson." These 23,000-ton vessels are nearing completion at the Bethlehem-Alameda Shipyard, Inc., in the San Francisco Bay area.





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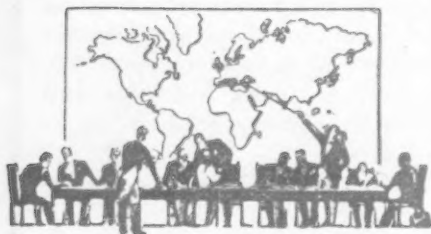
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# European Letter . . .

• Russia's participation in discussions at Paris on the Marshall Plan seen delaying execution of plan . . . Background of problems explained.



LONDON — Mr. Molotov has agreed to discuss the implications of the Marshall Plan for Europe with Mr. Bevin and Monsieur Bidault and conversations have begun in Paris. Those who regard Marshall's offer as an attempt to liberalize the Truman Doctrine and to return to the older conception of need, not ideology, as the effective claim on American help will welcome Russia's inclusion and the hope it offers of bridging Europe's fast petrifying divisions.

Those who on the other hand think of the Marshall Plan as a restatement of the Truman Doctrine in a form to which Mr. Wallace will be unable to object and on a scale which can capture the imagination of a very conservative Congress, will only regret that the Russian acceptance blunts the anti-Communist edge which they profess to see in Marshall's approach.

These reactions concern points of principle. But further objections have already been raised on the purely practical point that Russian participation may so delay the working out of the plan that the dollar crisis will overwhelm Europe before Congress can act.

The first point of decision must clearly be the question of procedure. Bevin, with Bidault more or less agreeing, may propose temporary committees of experts to advise on the assessment of needs, the balancing of contributions and

the allotting of priorities. The aim would be to keep the methods of working as flexible as possible and to work at every point to the speediest possible timetable. It is true that the official Soviet reply to the Anglo-French invitation agrees that the primary problem of European countries at the present time is the quickest possible reconstruction and further development of their national economy, but it does not follow that all will be subordinated to the acknowledged need for speed.

SOVIET RUSSIA does not wish economic aid to arrive too blatantly with dollar labels. It does not wish that aid to have political implications. It does not wish its distribution to be under primarily "Western" influence. Above all, it does not wish to foster a European federalism which, in the Russian view, would simply be an anti-Soviet *bloc* in light disguise. In other words, Russia might go so far in international cooperation as to support an international scheme resembling UNRRA—international in contributions and overall control, strictly national in receipt of local distribution.

There is only one body that in any way resembles UNRRA in these respects and that is the Economic

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Commission for Europe; so there can be little doubt that Russia will seek to make the ECE the machinery for evolving a plan not so much of European integration as of relief and rehabilitation for individual nations.

Neither the British nor the American government is likely to find this approach very satisfactory. The first conference held by the ECE, at the beginning of May this year, brought to light some considerable divisions of opinion between East and West. The East European states, led by Russia, were anxious to bring to an end at once the work of such functional committees as the European Coal Organization (of which Russia was not a member) and the Committee

for Inland Transport (on which Russia played no part); they also pressed for the immediate demise of the European Emergency Committee and the transfer of its powers to the Economic Commission for Europe.

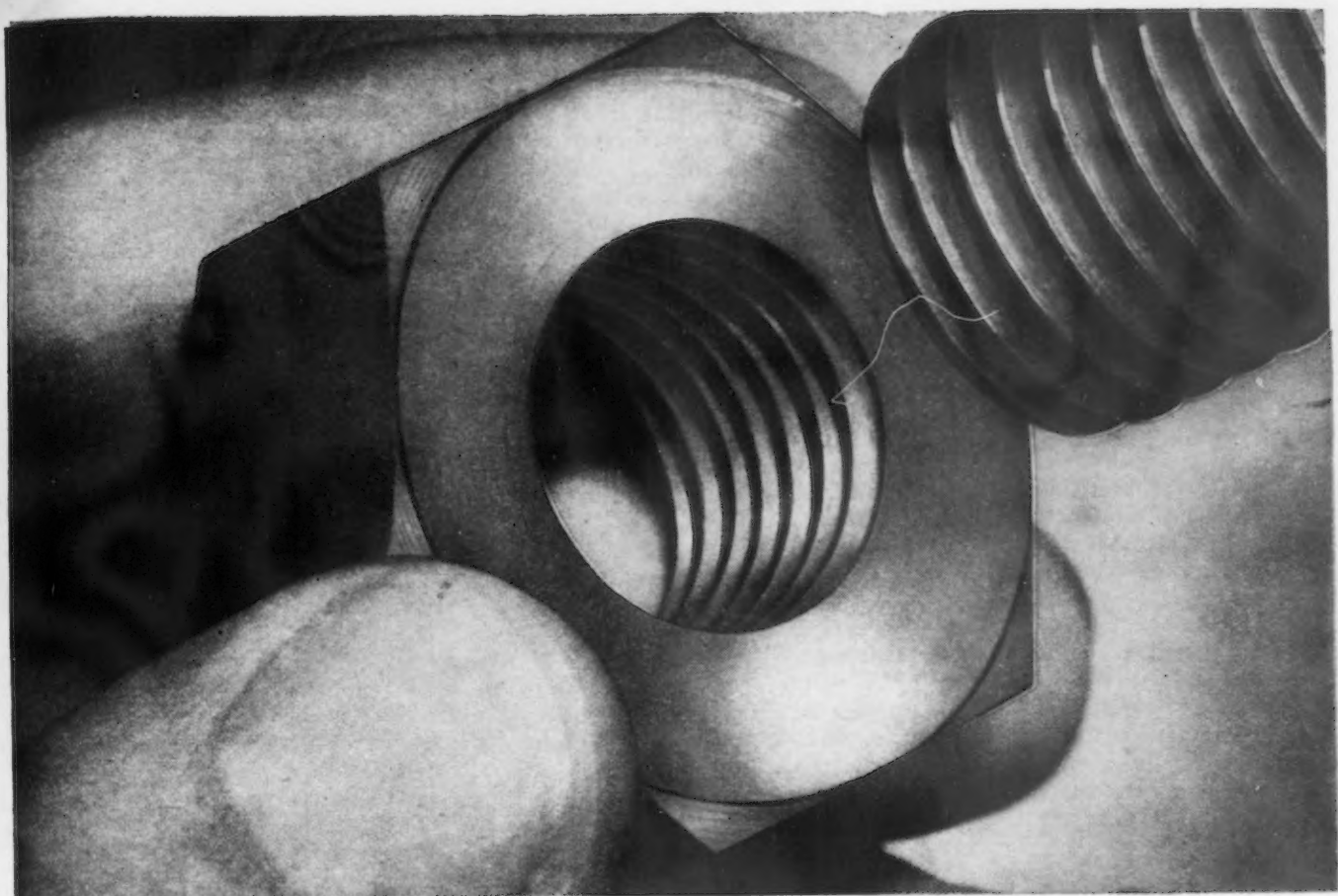
In all this there was a patent desire to reduce Western influence even at the risk of wrecking international machinery which was actually and effectively at work. Again in question of procedure, the attitude of Russia and the Eastern European states was to press for the time being for a two thirds majority rule which in effect would mean a veto on all decisions unacceptable to the East. These and other minor incidents convinced the delegates from Western Europe that any work done through the ECE would be hampered and delayed at every turn by the intense suspicions felt by Russia for all things Western and its determination to use any means—procedural or otherwise—to block policies to which it took exception.

Somewhat naturally, the governments in the West now tend to argue that to submit the Marshall Plan to such a body would simply risk endless delay and infinite frustration when the relentless passage of time remains the most important factor of all.

YET how miserably sterile it would be if a matter of machinery were to block the Marshall Plan at the outset. The difficulties presented by the ECE are after all difficulties which will arise in any case now that Russia is taking part in the discussions. Whatever machinery is set up will have to deal with intense Eastern suspicion and with stonewalling on unacceptable points. Is it certain that this opposition will be any worse inside than outside the ECE?

There are, moreover, some arguments for using the Commission. It is a child of the United Nations. Its legacy from the earlier European functional committees enables it to provide factual material and an embryonic organization for dealing with some of the problems. Above all, the Powers are already





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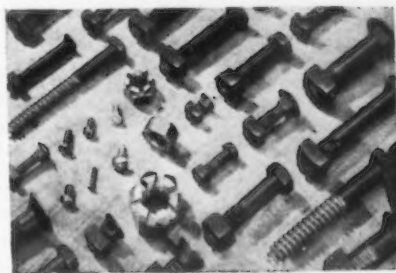
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represented in it — including the United States. Might it not therefore be the course of wisdom to reach a compromise between the Russian and the Western views?

A possible course of action might lie in strengthening, by the inclusion of the best technicians available, the various committees and panels which are waiting to be transferred from the European Emergency Committee to the ECE. Russia should be asked to appoint representatives to them immediately and they might, in a general way, be placed under the supervision of the ECE. The governments would continue to choose and pay them, but they could be temporarily seconded to ECE.

The matters covered in this fashion would be transport, food and agriculture, coal, public utilities, soft timber, fertilizers and alkalies. No committees or panels exist for dealing with iron or steel, textiles and their raw materials, fuels other than coal, rubber, machinery of all sorts or questions affecting labor. In these spheres, panels would need to be set up at once and they too might be grouped under the general responsibility of the ECE.

But would this approach differ in any way from Russia's probable proposals? Would it avoid the strictures of delay and obstruction already raised by the first meeting of the ECE? The answer surely is that with the mere presence of Russia in the negotiations these risks must be run, and the Western nations do not need so much to bypass the ECE from the first as to restrict its responsibility to that of general supervision and to have their alternative plans ready if they become convinced that the Commission is simply incapable of providing a working organization.

It should be clearly understood from the start that the British intend to abide by a timetable, and that they are not prepared, except within very narrow limits, to sacrifice this timetable for the sake of unanimity. If decisions are delayed and endless argument develops Bevin should take the lead in drawing up concrete proposals with those nations—Eastern or Western—which accept speed as the first criterion.

**T**HE first points on the agenda of the Powers should present few difficulties. Europe's needs are

not hard to assess since a mound of factual information already exists, and the task of the technical committees would be rather to disentangle the detail and work out priorities than actually to establish facts. But the moment the problem of Europe's own contribution is tackled, the Powers will be faced with a problem of very great complexity.

In many fields, particularly in the vital field of coal and steel production, it is an obvious fact that the difference between prewar European production and the present low levels is accounted for almost precisely by the catastrophic fall in German production. It is the reduction of German industry to stagnation that is, above all, responsible for Europe's failure to recover, and it is difficult to see how a sensible scheme for Europe can be evolved without taking account of this fact.

But if sheer force of circumstance elbows the German problem into the center of the European discussions, the Powers will find themselves facing once again the two great unsolved problems of the Moscow Conference — the Russian attitude to reparations and the French attitude to German reindustrialization.

The question facing the European Powers today is whether, within the framework of the Marshall offer, a new approach is possible. The essence of the idea is that, once Europe's own contribution to its needs has been assessed, the United States will assist in making up the balance. The bearing of this on the Moscow deadlock is obvious. In any honest assessment of Europe's needs, the Russian claim for help must be very large. Germany's potential contribution is also enormous. Would it not be possible to take the question of German industrial reconstruction out of the context of reparations and place it in the wider framework of mutual aid?

That Eastern Europe, on the basis of sheer need, would have a claim to a large part of what Germany could contribute is obvious, but Western Europe would gain equally from the revival of economic activity. The idea of reparations as such has become completely unreal in the face of Germany's inability to produce at all. But when German production has revived, it is entirely reasonable

that a large claim upon it—a larger claim proportionately than on the production of any other European country—should be stated in favor of the needs of Europe as a whole.

American capital would assist the process, not as a direct contribution to balancing the budget of an Anglo-American Zone, but rather as a contribution making good the deficit in an overall European balance sheet. In short, the aim would be to break the deadlock at Moscow by substituting two wider conceptions for the old categories—mutual aid instead of reparations and the European economy as a whole instead of the balancing of German production between Western help and Eastern demands.

**B**UT even if this transformation were possible, French objections to the reindustrialization of the Rhineland would remain, and it would clearly be unwise to alienate a vital partner and neighbor in Western Europe for the problematical goodwill of the Eastern European negotiators. Two types of safeguard for France's legitimate fears have been discussed.

The first, proposed by the French themselves, is that the reconstruction and expansion of the steel industry in France should take precedence over Germany's and that a higher proportion of German coal should permanently be dispatched to Lorraine. Such a policy is not inherently impossible, but the first step is to increase German coal output; and this process is inseparable from general industrial revival in the Ruhr. Priorities for France could, nevertheless, be included in a long-term scheme.

The other suggested safeguard is that some sort of international supervisory body should oversee the development of the Ruhr as a whole. If such a body were to be composed of the West European nations only, it would raise no particular difficulties. But clearly the Russians will press to be represented, and the record of such bodies as the Kommandatura in Berlin discourages optimism for the working of such an inter-Allied body. If it were accepted as a solution, the Western Powers would need to frame a procedure which would safeguard their voting position and might reasonably ask a *quid pro quo*, possibly in the shape of similar supervision of the Silesian industrial complex.





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# PERSONALS

• **Louis J. Rohl** has been appointed chief metallurgical engineer of Carnegie-Illinois Steel Corp., Pittsburgh, succeeding **E. T. Barron**, who is retiring after 42 years with this U. S. Steel Corp. subsidiary. Mr. Rohl was first employed by Carnegie-Illinois at South Works, Chicago, in 1917. He advanced to manager of the Chicago district metallurgical department in 1943 and last April became assistant chief metallurgical engineer with headquarters in Pittsburgh.

• **Fred L. Wagner** has been appointed assistant sales manager for Universal Atlas Cement Co., Pittsburgh, U. S. Steel Corp. subsidiary. Mr. Wagner has been with the company as sales representative for more than 25 years in Western Pennsylvania and West Virginia, most recently in metropolitan Pittsburgh.

• **Robert L. Stickley** has been appointed distributor promotion specialist of Carboloy Co., Inc., Detroit. Mr. Stickley, who succeeds **T. D. Emerson**, recently resigned, was formerly advertising and sales promotion manager at Progressive Welder Co.

• **Harold L. Hoefman** has been elected vice-president in charge of manufacturing of the Link-Belt Co., Chicago. Mr. Hoefman, who has been general manager of the company's Pershing Road plant, Chicago, since 1943, until his recent appointment as vice-president, entered the employ of this plant in 1920 as a draftsman. **David E. Davidson** has been appointed general manager of the Pershing Road plant, to succeed Mr. Hoefman. Mr. Davidson has headed the engineering department at the Pershing Road plant since the beginning of the year. He entered the employ of the company's Caldwell plant, Chicago, in 1924.

• **A. R. Collins** has been appointed head of manufacturing and engineering of Div. III, Stewart-Warner Corp.'s South Wind heater plant at Indianapolis, Ind. Mr. Collins has been a member of the division's engineering staff since 1942. **E. L. Sandberg**, chief accounting officer, has been appointed to the additional post of assistant to Mr. Collins, and **W. E. Judd** has been made assistant sales manager.

• **Tom Barlow** has joined the Eastern Clay Products, Inc., Eifort, Ohio, as general sales manager. He has been active in the foundry industry since 1935. During recent years Mr. Barlow has been assigned to liaison and development work for the Gray Iron Research Institute, Inc., and more recently to the development program on the Westonite process for Eastern Clay Products, Inc.



**GEORGE A. CUSTER**, vice-president in charge of manufacturing, Peninsular Grinding Wheel Co.

• **George A. Custer** has been elected vice-president in charge of manufacturing, Peninsular Grinding Wheel Co., Detroit. **C. H. Rickenback** has been named assistant secretary. Mr. Custer has been factory superintendent of Peninsular for 2 years and chief engineer for 8 years. Mr. Rickenback has been office and personnel manager for the past 5 years.

• **T. R. Coffey** has been appointed manager of sales of Globe Steel Tubes Co.'s Detroit office, effective July 14. He has served as manager of sales of the Wisconsin office since 1943 and prior to that time was associated with Globe Steel Tubes Co. since 1928 in various capacities in the general sales department.

• **William F. Bates** has been appointed regional sales manager in the New England area for the Phosphor Bronze Smelting Co., Philadelphia, and **H. C. Geittmann, Jr.** has been named sales manager of the company's casting division. Mr. Bates has been recently released from the U. S. Army. He was formerly associated with Rheem Mfg. Co. Mr. Geittmann was formerly sales engineer with the standard steel works division of the Baldwin Locomotive Works and foundry engineer for the Steel Sales Corp.

• **Leland S. Hanson**, who has been manager of the Chase Brass & Copper Co. New York branch since 1938, has been promoted to sales manager, eastern division, and will eventually make his headquarters at the company's main offices in Waterbury, Conn. **Herbert H. Bartlett**, manager of the Chicago branch since 1934, succeeds Mr. Hanson as manager of the New York branch. **G. Townsend Underhill**, who has been sales manager of the New York branch for the past several years, has been promoted to manager of the Chicago branch.

• **Lloyd W. Hackley** has been named superintendent of production planning, American Steel & Wire Co., Cleveland, succeeding **F. J. Boes**, retired. **James E. Rogerson** has been made assistant superintendent of the production planning department to succeed Mr. Hackley. Mr. Hackley has been associated with American Steel & Wire Co. since 1937, when he was engaged as an industrial engineer. Since 1944, he has been assistant superintendent of production planning. Mr. Rogerson has been associated with the company since 1937 when he started as a junior industrial engineer in the Pittsburgh district office. He has held a number of positions since that time, and since 1944 has been general supervisor of procedure and organization in the production planning department.

• **Thura A. Engstrom** has been named vice-president to Continental Motors Corp., Muskegon, Mich. He started with Continental in 1925 and served as chairman of the labor relations committee during the war period. More recently he has been acting factory manager at Muskegon.



## PERSONALS

• **J. M. Ellis**, general manager of sales of Bethlehem Steel Co., Bethlehem, has been appointed assistant to the vice-president. **K. L. Griffith**, assistant general manager of sales, has been appointed general manager of sales. **D. C. Roscoe**, manager of sales, sheets and strip, has been named assistant general manager of sales. **A. T. Hunt**, manager of sales, galvanized sheets and formed products, has been appointed manager of sales, sheets and strips; and **M. C. Schrader**, assistant to the general manager, has been appointed assistant to the vice-president.

• **W. S. McAleer** has been elected vice-president of the McNally Pittsburg Mfg. Corp., Pittsburg, Kan. He will maintain headquarters in Pittsburgh, Pa., as manager of the Eastern district of the company. Mr. McAleer joined the company in 1941 as manager of the Pittsburgh office.

• **John Oswald** has been appointed executive engineer of styling and body engineering of the Ford Motor Co., Dearborn, Mich.

• **Ernest C. Adams**, formerly vice-president, Morse Twist Drill & Machine Co., a subsidiary of Van Norman Co., has been transferred to Springfield, Mass., as manager of sales of Van Norman machine tool division, and has been made a vice-president.

• **L. L. DeWolf** has been appointed superintendent of marine erection, the Babcock & Wilcox Co., New York. Mr. DeWolf has been assistant superintendent of marine erection since 1941 when he came to the New York office from the marine engineering department in Barberton. He joined the company in 1929 in the engineering division, and later was transferred to the marine engineering department.

• **Ben H. Anibal**, who has directed the engineering development of the Pontiac car since its inception, has retired from the Pontiac Motor Div., General Motors Corp., Pontiac, Mich. Mr. Anibal has been with General Motors 34 years and a chief engineer for 25 years.



**LORENZ WILSON** (left), chief metallurgist, Farrell and Lowellville works, and **FRED B. QUIGLEY** (right), general works manager of blast furnaces, steel works and finishing mills, Farrell works, Sharon Steel Corp.

• **Lorenz Wilson** has been appointed chief metallurgist of the Farrell and Lowellville works of the Sharon Steel Corp., Sharon, Pa. This position includes metallurgical and chemical control of the blast furnaces, steel plants and all finishing operations. Mr. Wilson has been chief metallurgist of the finishing mills at Farrell for the past 2 years and has been connected with the Sharon Steel Corp. in a metallurgical capacity for 16 years and has been active in the development of stainless steel products. **Fred B. Quigley** has been appointed general works manager of the blast furnaces, steel works and finishing mills of the Sharon Steel Corp. at Farrell, Pa. Mr. Quigley was formerly general superintendent of the Farrell works of the Carnegie-Illinois Steel Corp. and came with Sharon as works manager of the blast furnaces and steel plants in 1945. **Phillips M. Connor** has been made assistant general works manager of the blast furnaces, steel works and hot strip mills of Sharon Steel at Farrell. He has been associated with the corporation for the past 12 years in a metallurgical capacity. **Reese B. Jones** has been appointed assistant general works manager of the finishing departments at Farrell. Mr. Jones has been associated with Sharon as assistant to the works manager of the finishing mills for the past 2 years.

He was formerly connected with Sharon Steel Corp.'s subsidiary, the Niles Rolling Mill Co., as superintendent of the galvanizing and pickling departments.

• **Morris S. Garber**, who for 13 years was general manager of Garten Table Pad Co., has now become affiliated with Mastercraft Products, Philadelphia.

• **Brig. Gen. Hugh C. Minton**, who was named production manager of Koppers Co., Inc., Pittsburgh, recently, has been appointed a vice-president of the company.

• **John L. McCaffrey**, president of the International Harvester Co., has been elected a director of the Santa Fe Ry., Chicago.

• **Col. Leslie S. Fletcher** has been appointed technical director of Sam Tour & Co., Inc., and its affiliate, the American Standards Testing Bureau, Inc., New York. Col. Fletcher is retiring from the Regular Army after 23 years of commissioned service.

• **Harry Oldham** has been named superintendent of the New Brunswick, N. J., foundry of Mack Trucks, Inc., New York. Mr. Oldham was formerly with the Ford Motor Co., where he was employed for 23 years in various top foundry positions.

• **W. E. Blowney** and **P. H. Knowlton** have been named assistant division engineers of General Electric Co.'s turbine-generator engineering division, Schenectady. **Alan Howard**, formerly assistant designing engineer, has been named section engineer of the gas turbine section; **E. E. Parker** has been appointed section engineer of the steam turbine section, and **H. D. Taylor** has been named section engineer of the generator section. Mr. Blowney joined General Electric in 1918. During his career with the company, he has been connected with turbine engineering and with steam research. Mr. Knowlton entered GE's student test course at Schenectady in 1925, and transferred to the turbine division the next year. For many years he has headed the steam research section, and in 1944 he was named assistant designing engineer. Mr. Howard, who was in charge of the design and development of the TG-100 and TG-180 aircraft gas turbines during the war, has been with General Electric since 1927. Recently he has been in charge of design and development of gas turbines for locomotive and stationary power purposes. Mr. Parker, in 1931, joined the GE test course at Schenectady. In 1944 he was made assistant designing engineer of the turbine engineering division, a position he has held until his recent appointment. Mr. Taylor joined the GE student test course in 1921 as an engineer in the turbine engineering department. In 1936 he joined the turbine-generator engineering division as assistant designing engineer.

• **Leonard R. Scribner** has been appointed chief engineer of the tantalum sales division of Fansteel Metallurgical Corp., North Chicago, to succeed **Frederick L. Hunter**, who has resigned. Mr. Hunter is entering into private consulting practice but will continue to devote a substantial portion of his time to Fansteel. Dr. Scribner joined the Fansteel organization in 1937, and has been actively connected with the engineering and sale of tantalum products since 1939.



**EDWARD P. GEARY**, vice-president and general sales manager, Atlas Steels Ltd.

• **Edward P. Geary** has been elected vice-president and general sales manager of Atlas Steels Ltd., Welland, Ont. He will supervise all commercial activities including both the domestic and the export sales divisions. Mr. Geary is closing out Geary Stainless Steel Co., Baltimore. He opened the midwestern territory in Chicago for Rustless Iron & Steel Corp. in 1937 and was assistant vice-president in charge of sales of the company for 6 years through 1945.

• **E. H. Vedder** has been appointed manager of the electronic control engineering section and **R. W. Staggs** has been named manager of the electronic control sales section of the Westinghouse Electric Corp. in Buffalo. Mr. Staggs is also responsible for sales activities of resistance welding control. **C. B. Stadum** has been appointed manager of the resistance welding engineering section and **W. G. Roman** has been named manager of the electronic section. Both will report to Mr. Vedder.

• **Morris S. Evans** has been appointed manager of the estimating division, American Car & Foundry Co., New York. Mr. Evans has successively served as superintendent, improvement and maintenance, local engineer, assistant to district manager and since 1940 as district manager of ACF Buffalo plant.

• **Walter C. Lavers** and **Joseph F. Liebscher**, both formerly application engineers, have been appointed representatives of Kennametal, Inc., Latrobe, Pa., and will work out of the Los Angeles office. **Ralph L. Miller** has been appointed a representative in the Reading, Pa. area, with headquarters in Philadelphia. **Hugh A. Pilling** and **Frank E. Ryan, Jr.** have been added to Kennametal's staff of application engineers. Mr. Pilling will work out of the Philadelphia office, and Mr. Ryan will work out of the New England district headquarters at Springfield, Mass. **William D. Huston** and **D. C. Cunningham** have also been added to the staff of application engineers and they will work out of the Detroit office. **Gilbert A. Bunn** has been appointed district manager of the Philadelphia district of Kennametal, Inc. Mr. Bunn has been a Kennametal representative in the central area for many years.

• **Harry V. Snow**, former implement sales manager for Allis-Chalmers Mfg. Co., has been named tractor and implement sales manager of Dearborn Motors Corp., Detroit. Mr. Snow joined Allis-Chalmers in 1935 at its Memphis branch and was later transferred to Milwaukee. He was appointed implement sales manager in 1942.

## OBITUARY...

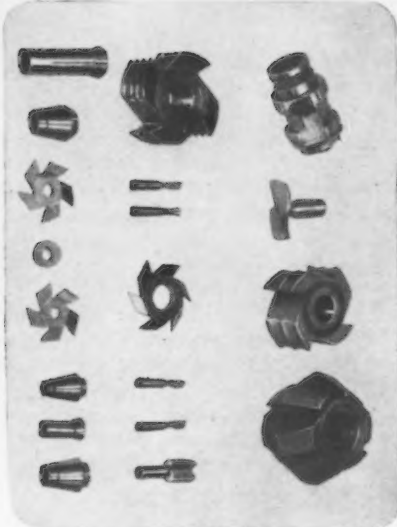
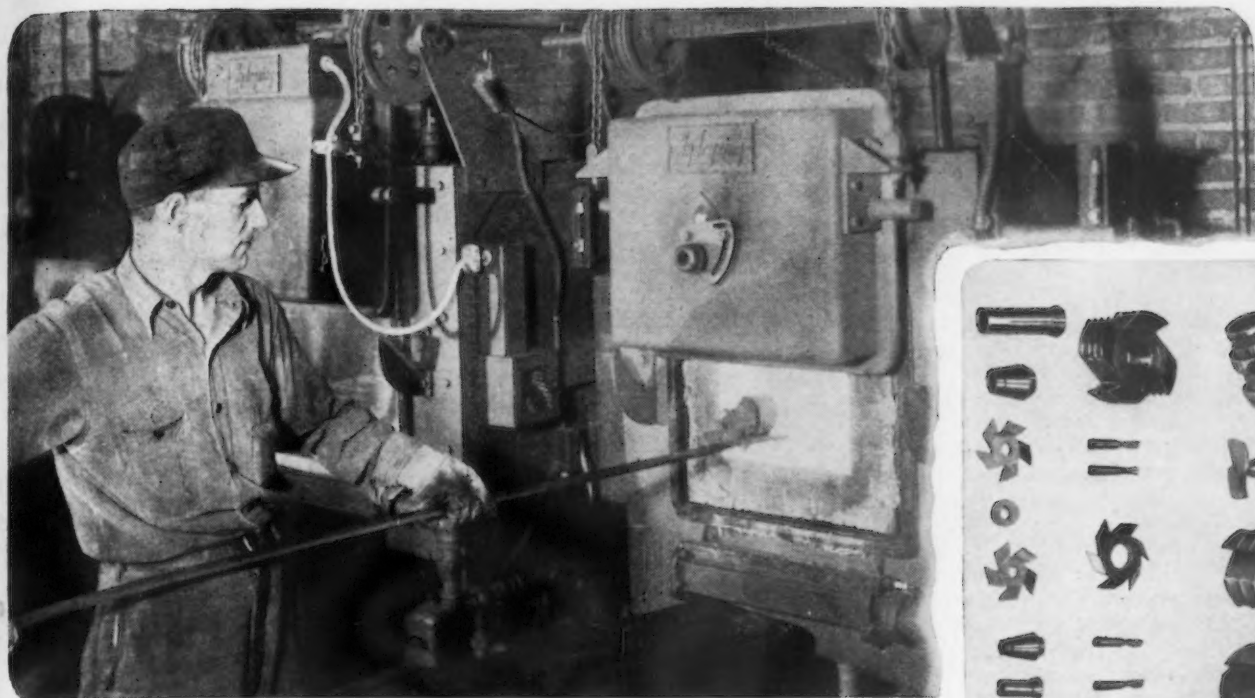
• **Walter H. Baker**, 67, president of Universal-Cyclops Steel Co., Bridgeville, Pa., died June 26.

• **Harry A. Maurer**, 70, former general superintendent, director and secretary of the Oster Mfg. Co. of Cleveland, died on June 17 after an illness of several months. He had been associated with Oster since 1905, and had retired from active duty with the company about a year ago but had acted in a consulting capacity.

• **Thomas J. O'Connell**, 53, purchasing agent for the Hanna Furnace Corp., Buffalo, died June 22.

• **Frank J. Marmion**, 54, Pittsburgh district manager of sales, American Steel & Wire Co., died suddenly June 30. He joined the Wire company in 1902.





**ONSRUD hardens high speed cutters  
without Scale, Carb, or Decarb  
in LINDBERG HYDRYZING FURNACES**

*Doubles Production—Eliminates Rejects!*



Erick Olsen,  
Plant Supt. at  
Onsrud says:

**"WE GET MUCH BETTER HARDNESS UNI-  
FORMITY, AND WE AREN'T BOTHERED WITH  
SCALE OR DECARB. WE'VE DOUBLED OUR  
HEAT TREAT PRODUCTION, AND WE DON'T  
HAVE ANY HEAT TREAT REJECTS ANYMORE.  
—AND MAINTENANCE IS WAY DOWN."**

In July 1945 Onsrud Machine Works, Chicago, manufacturers of high speed cutters for routing, shaping, and carving, installed two Lindberg Hydrying furnaces,—a preheat and a high heat, along with a Lindberg HYCO atmosphere generator. This equipment replaced two conventional non-atmosphere box type furnaces of the same size.

Month in and month out production shows that Hydrying hardening lengthens the already long operating life of Onsrud cutters.

*Daily hardening production on this Onsrud 1/4" Router  
Bit was increased from 500 to 1000. Some of the reasons:*

- ... With Lindberg furnaces, the entire hearth area can be used. This is because both the front and back areas of the hearth reach and hold the same temperature as the center area.
- ... Lindberg Furnaces reach hardening heat 25% quicker.
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- ... Rejects due to hardening were cut from an average of 50 cutters per 1000 to zero. (This is a fact vouched for by Mr. Olsen.)

Lindberg Engineering Company, 2452 W. Hubbard St., Chicago 12, Ill.

*Write for bulletin 95-hs, "Lindberg Hydrying Furnaces," and a reprint of an article, "Heat Treatment of High Speed Steel Cutters."*

# LINDBERG FURNACES

# Dear Editor:

## STEEL DRUMS

Sir:

We have read with interest the column entitled "Washington" beginning on p. 82 of your May 29 issue. We have particularly noted the statistics for steel drum output set forth on p. 114. We felt that you would appreciate it if we called your attention to the fact that, as a matter of public record, Bethlehem Steel Co. owns only 30 pct of our outstanding stock. Furthermore, we thought it would be interesting for you to know that Bethlehem Steel Co. has no representative on our board of directors. We feel you will agree that, under these circumstances, it can hardly be said Bethlehem Steel Co. controls our business or that, by reason of their minority stock interest in our company, Bethlehem Steel Co. is engaged in the production of steel drums.

C. V. COONS  
General Sales Manager  
Rheem Mfg. Co.  
New York

## NEEDED IN NORWAY

Sir:

Please send us by air mail photo-stat of the article "Stamped or Die Cast, Which, When and Why?" which appeared in the Jan. 18, 1940 issue.

A. S. NARVESENS  
Oslo, Norway

## COUPLINGS AND PINTLE CHAIN

Sir:

We are looking for a quantity of approximately 200, 6-splined couplings, on sleeves about 3 in. in length to fit over standard 6-splined shafts, 1½ and 1¾ in. diam. We are also in the market, for September or October delivery this year, for approximately 800 ft No. 452 pintle chain. Kindly advise the names of possible suppliers.

G. F. HINDS  
Purchasing Agent  
Robinson Equipment Co., Ltd.  
Calgary, Alberta, Canada

● Try the companies whose names we are sending.—Ed.

## MARTEMPERING

Sir:

Would you kindly forward us a copy of B. F. Shepherd's article on "Martempering" in the Jan. 28, 1943 issue.

H. D. McCARTY  
Baltimore Tool Works  
Baltimore

## MAGNETIC SWEEPERS

Sir:

Do you know the concern who makes the magnet that has wheels on it for moving around factory or yard and

which picks up nails. Our first thought was writing to your organization for information which you might have available. Can you help us out by giving us the name of the manufacturer of this magnet truck?

FRED J. CHAMBERLAIN  
Worcester, Mass.

● We are forwarding names of several companies who manufacture magnetic sweepers.—Ed.

## TRACTOR CAB TOPS

Sir:

We have a problem of getting a top for a cab for tractors—pressed in one piece. It is not too different in size from the ordinary cab top for a two-passenger automobile. We would appreciate if you would give us some names of different companies who have facilities and who might be interested in pressing some of these for us.

CHARLES S. SMITH  
Pierce Roofing Co.  
Olean, N. Y.

● The "Blue Book of Stamping Manufacturers" published by the Pressed Metal Institute, 829 Union Commerce Bldg., Cleveland 14, lists stamping firms, together with the facilities and equipment of each and the type of work they are able to handle. We are forwarding a tear sheet of p. 221 of the June 5 issue in which several stamping firms are advertising for work.—Ed.

## "WANTED"

Sir:

... That is a good ad for THE IRON AGE on p. 49 of the May 8 issue. It has "point." Makes 'em stop and read.

J. P. CRANSTON  
James Mfg. Co.  
Fort Atkinson, Wis.

## PROSPECTIVE MARKETS

Sir:

... Our associate company, W. A. Netting & Wire Co., Ltd., manufacture galvanized wire netting and galvanized wire and in the course of manufacture, a considerable amount of zinc oxide is formed on their galvanizing baths. The baths are skimmed regularly and the product treated in a zinc extraction plant, the free metal being reclaimed in ingot form, and the balance is in the form of zinc oxide dust in the crude form. We have noticed in your journal a price for zinc oxide in the U. S., and in view of the fact that zinc in your country is very much higher in price than it is here in Australia, we feel sure that it would be economically sound for us to export if, and when, the present embargo is lifted. We would, therefore, be pleased if you would let us know the names of some

firms in America who purchase the crude zinc oxide from the various galvanizers, and refine it.

Another query is in connection with lead concentrates. The managing director is interested in a lead mine, and as the Commonwealth Government permits the export of lead concentrates, we would esteem it a favor if you would also let us have the names of firms who are likely importers to your country of this material.

G. W. CLARK  
Malloch Bros. Ltd.  
Perth, W. Australia

● Probably the best market for zinc oxide dust in the crude form would be lithopone manufacturers, names of whom we are forwarding, together with another list of companies who might be prospective customers for the lead concentrates.—Ed.

## METAL FINISHING

Sir:

Will you kindly send us the article on "Effect of Water Conditioning on Metal Finishing Operations," by Robert S. Herwig, found in the Mar. 27 issue, p. 48-52.

T. C. MCKENZIE  
President  
Klem Chemical Works  
Dearborn, Mich.

## BRITISH INTEREST, TOO

Sir:

On the Newsfront page of the May 20 issue is a notice of a new silver alloy paste used for brazing carbide tool tips. If you can give us any information about this paste and the name of its manufacturer we shall appreciate it.

G. E. BELL  
Delegate Director  
Deloro Stellite Ltd.  
Birmingham, England

● The product is manufactured by Sherman & Co., 197 Canal St., New York 13. Write to Mr. Monroe Sherman for further details.—Ed.

## MACHINE TOOL EXPORTS

Sir:

Please forward a copy if available of the reports carried on pp. 120 and 121 of the June 19 issue covering machine tool exports for the year 1946 and the first quarter of 1947.

D. E. MERRIMAN  
Purchasing Agent  
Stanley Works  
New Britain, Conn.

## DUPLEXING METHODS

Sir:

Please send me tear sheets on "Duplexing Low Carbon Alloys," and "Hardness Distribution in Chips and Machined Surfaces," which appear in the May 22 issue.

E. G. PRESSER  
Chief Metallurgist  
National Supply Co.  
Springfield, Ohio



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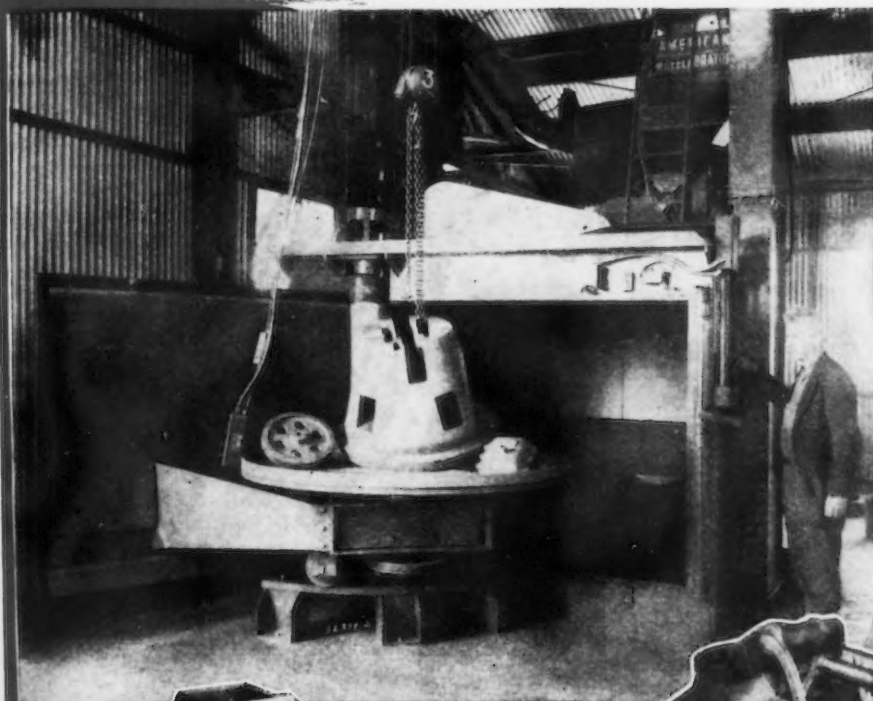
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# Industrial News Summary...

- **General Steel Price Rise Coming**
- **Steel Ingot Rate Jumps to 84 Pct**
- **Scrap Market Getting Set for Rise**

**T**HE average price of steel will be advanced this week or next one-fourth of a cent a pound, or \$5 a ton because of higher steelmaking costs. The U. S. Steel Corp. is expected late this week to take the lead in the price adjustment which will cover virtually all major steel products.

The steel price increase will amount to about 8.8 pct on the basis of THE IRON AGE weighted steel composite price of finished steel which this week was 2.85664¢ per lb. After the price adjustment is made the average price of steel is expected to be about 3.11¢ per lb.

When the new steel prices are announced (and they will become effective immediately because steel is now sold on the basis of price at time of shipment), the average price for finished steel will be 33.4 pct higher than it was in 1939 when competition had driven the price of steel somewhat below the 1937 average. Compared with the average price in 1946, the new steel price will be about 16 pct higher than in that period.

**T**HE industry's experience following the steel labor contract, increased coal costs and a continual loss on some products are the basic reasons given for the price increase which is to be announced soon. There is the possibility that with a better return the steel industry will turn out more of the hard-to-get items as well as more of those products on which the profit has been small. A better distribution of various steel products is also likely to follow the price increase, although automobile and homes appliance manufacturers may be forced to raise their prices almost immediately.

The settlement of the coal issue between the Northern operators and the steel captive mines has meant a complete capitulation to the major demands of John L. Lewis. The few demands which he did not realize were insignificant to what he obtained for the miners. Although the negotiations between Mr. Lewis, Benjamin F. Fairless, U. S. Steel Corp. president, and George M. Humphrey, board chairman of Pittsburgh Consolidated Coal Co., began 12 or 13 days ago, groundwork for the meeting had been ably broken before that time.

Rather than face a complete shutdown in the steel industry with a possible irreparable loss of 4 to 6 million tons of steel because of the coal strike, the leading industrialists involved in the negotiations felt that the coal contract was not too high a price to pay to prevent a total breakdown in industrial production such as occurred in 1946. The same pattern of approach (high level pre-negotiations) which was adopted during the steel negotiations was followed through to prevent a coal tieup. In both cases the leading figure was Mr. Fairless.

With both coal and steel problems settled for at least a year there was some indication this

week that the steel industry in 1947 would come within striking distance of the all-time high in output made in 1944 when steel firms produced 89,642,000 tons of steel. There is a good possibility that steel output this year will go beyond 85 million ingot tons.

**T**HE industry staged a quick comeback this week with average steel ingot production for the week estimated at 84 pct of rated capacity, up 9 points from last week's rate of 75 pct and only 11 points away from the activity in the week before the coal crisis. By the end of this week it is expected that the average figure for the industry will be close to 95 pct of capacity.

In an attempt to make up some of the loss in steel production which because of the coal situation may amount to 600,000 tons of ingots, steel firms after the price increase becomes a fact may put into operation some higher cost units and may also speed plans for increasing capacity—either by new metallurgical developments or by new construction in addition to that which is already under way.

A quick check of major steel sales executives indicates that while there has been some cancellation or postponement of steel deliveries new order volume continues far ahead of current production. Most officials see no possible general letdown in steel activity until sometime next year.

**P**RICES being paid on the gray market for thin gage sheets run as high as \$250 to \$255 a ton, compared with the mill price, delivered to the consumer and including extras and freight, of \$75 to \$80 a ton. Some of the heavier gages of sheets were selling on the gray market at \$175 a ton, compared with a mill delivered price of \$70 to \$75 a ton. Higher steel prices on mill schedules are expected to adversely affect the gray market activity but until steel becomes plentiful premium prices will still be obtained.

While no major price changes occurred in the scrap market this week, the situation was tense and brokers were fearful of selling at published quotations. The steel price increase, when it comes, is expected to give the scrap market another shot in the arm and the long-term shortage outlook for scrap will come into bolder relief.

Major demands obtained by John L. Lewis for the miners which surpassed those obtained earlier in CIO contracts are as follows: The same pay for 8 hours' work as was paid for 9 hours' work, plus 15¢ an hr, which amounts to an increase in take-home pay for an hour's less work of \$1.20 a day. The new rate is now \$13.05 a day. The welfare fund contribution has been increased from 5¢ a ton to 10¢ a ton. The whole problem of unionization of foremen has been by-passed. An escape clause on possible civil suits against miners for outlaw strikes has been won by the UMW. The contract is for 1 year instead of 2 years as demanded by the operators.



**• ITALIAN IMPORTS IMPROVE**—Italian foundries, after a year of extremely scant pig iron supplies, consider prospects for the balance of this year to be much brighter. The Italian Government is arranging barter deals to exchange Italian fruit and other agricultural products for pig iron. Continental sources expect shipments from the United States to total 10,000 tons, and negotiations with Brazil and with Mexico are now going on. Italians also hope to receive small tonnages from Turkey, and The Netherlands expects to be able to furnish about 8000 tons. Arrangements were made to import small tonnages of special iron from England as that product had been freed from government export controls, but it is now expected that exports of this product from England will be banned again. Italian officials are also attempting to arrange supplies from France. Russian sources have indicated that in exchange for heavy engineering products, Russia would be able to furnish pig iron for export. Pig iron scrap will also be imported into Italy from Austria, Poland, Czechoslovakia, and Hungary.

**• FREIGHT CAR LOADINGS**—Freight car loadings in the third quarter of 1947 are expected to be 4.7 pct above those in the same period in 1946, according to estimates compiled by the 13 shippers advisory boards. On the basis of those estimates, freight car loadings of the 32 principal commodity groups will be 8,652,845 cars in the third quarter of 1947, compared with 8,261,681 actual car loadings for the same commodity groups in the corresponding period in the preceding year. All of the 13 shippers advisory boards, except the Ohio Valley board, estimate an increase in carloadings for the third quarter of 1947, compared with the same period of 1946.

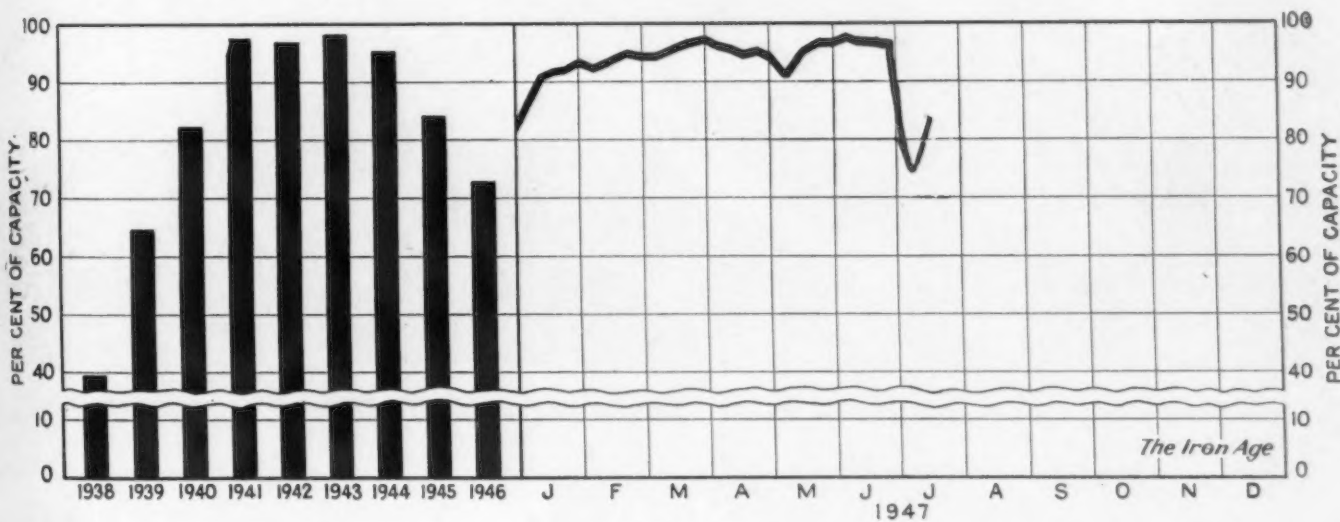
**• FLOOD RELIEF**—An emergency appropriation of \$12 million by Congress has been put to work by the Army's Corps of Engineers, Lt. Gen. R. A. Wheeler, Chief of Engineers, has announced. It will be allocated to the flooded areas on a basis of need with all of it going to "repair, restoration and strengthening of levees and other flood control" which have been either threatened or destroyed by high waters.

**• IRON ORE SHIPMENT**—Shipments of iron ore from upper Lake ports in June totaled 11,457,455 gross tons, an increase of 2,803,018 gross tons over June 1946, and 1,084,602 gross tons over May 1947, the Lake Superior Iron Ore Assn. reported. June shipments brought the season's total to 26,278,719 tons, an increase of 13,278,265 tons over the 1946 movement at the same date. More than 30 pct of the total was loaded at the Great Northern Dock at Superior, Wis., and about 45 pct at Duluth and Two Harbors. Shipments from the Canadian ports of Michipicoten and Port Arthur in June totaled 257,129 gross tons, 2.24 pct of the June total and 1.81 pct of the season's shipments.

**• INDUSTRIAL EARNINGS** — Iron and steel corporations paid out 13 pct more in dividends during the first 4 months of 1947 than during the same period in 1946, the Commerce Dept. reports. For the first 4 months of 1947, dividend payments of more than \$70 million were announced by the iron and steel companies against about \$60 million for the same period, last year. Only two industrial groups—food-beverages-tobacco and chemicals—paid out greater amounts. Total dividends announced by the nation's business firms for the period amounted to \$1.5 billion, as compared with \$1.3 in 1946. Railway dividends declined 13 pct during the period while mining groups paid out 26 pct more; the transportation group of manufacturers reduced dividends by 25 pct. Dividends announced in other categories were (in millions of dollars): Nonferrous metals, 28; mining, 35; railroads, 70; automotive, 58; transportation equipment, 25; electrical machinery, 41; and, other machinery, 59.

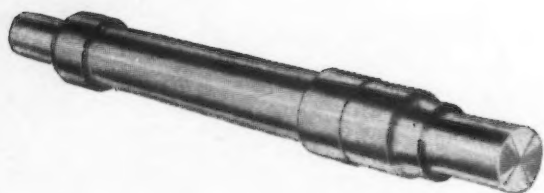
**• INVENTORIES** — Preliminary figures indicate that manufacturers' inventories increased \$300 million in book value during May, indicating that as of the first of June, total inventories amounted to \$22.4 billion, according to the Dept. of Commerce. All durable goods showed a rising trend while the stocks of food held by manufacturers continued to decline. About \$11.6 billion of the total inventories was held by durable and \$10.8 by nondurable manufacturers. Manufacturers' shipments and deliveries continued to edge downward during May.

Steel Ingot Production by Districts and Per Cent of Capacity



Week of	Pittsburgh	Chicago	Youngstown	Philadelphia	Cleveland	Buffalo	Wheeling	South	Detroit	West	Ohio River	St. Louis	East	Aggregate
July 1, .....	63.0	90.0*	58.0	78.0	52.0	82.0	80.0	89.0	101.0	106.0	102.0	82.0	80.0	75.0
July 8, .....	90.0	94.0	68.0	93.0	82.0	102.0	75.0	99.0	101.0	87.0	98.0	84.0	87.0	84.0†

\* Revised.  
† Preliminary.



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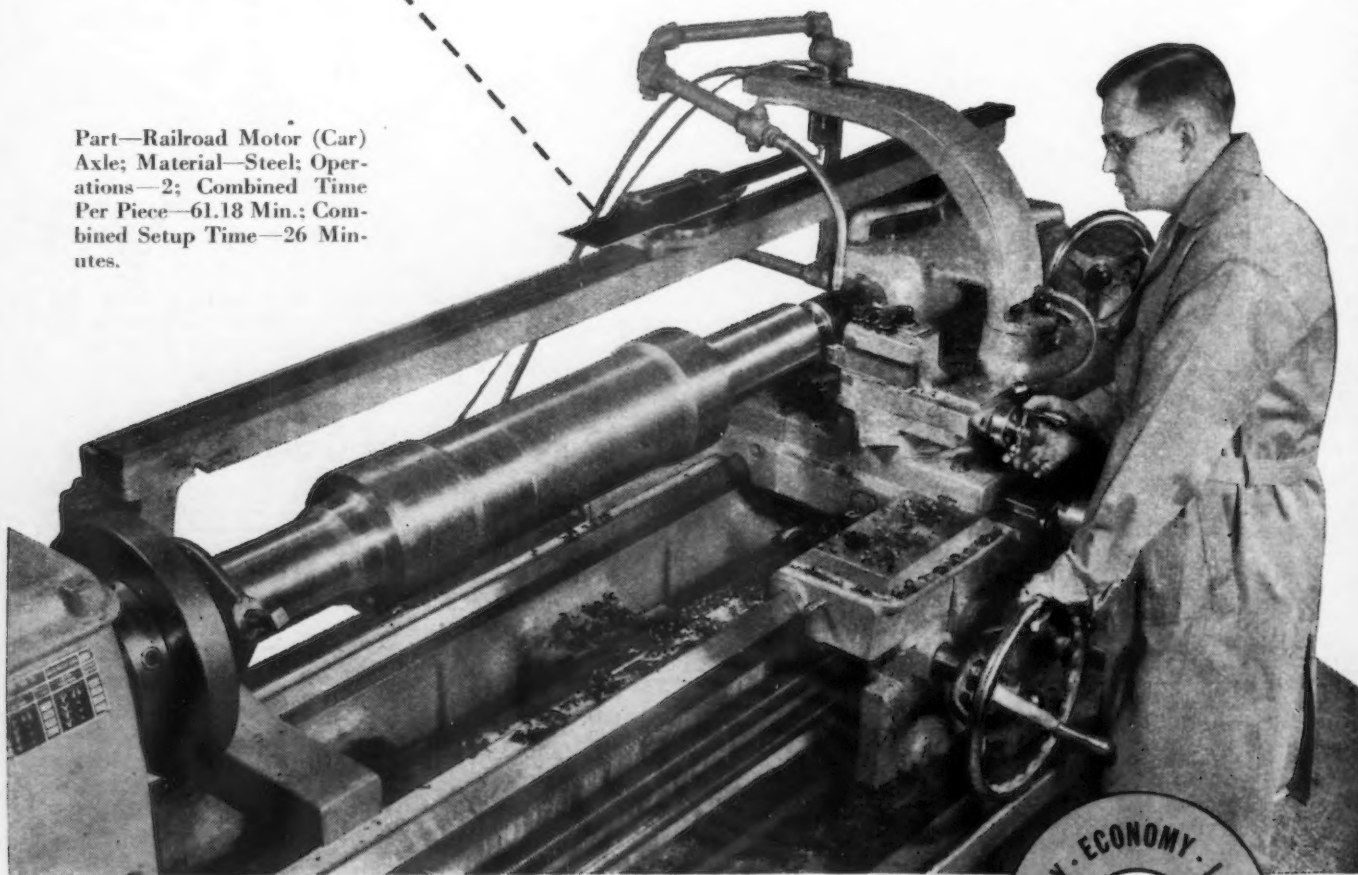
But machining time is not the only saving we're making for them. We've cut down on rejects—and we've improved finish and fit. Accuracy is an inherent feature of AIR-TRACING—and since operation is automatic, human errors are minimized.

These advantages are equally available on a wide range of work—boring or turning contours, machining step shafts or ordinary production lathe jobs. For any work of this class you'll find the new Monarch Air-Tracer an efficient, versatile, *economical* attachment. Like more details? Ask for bulletin 2601.

**THE MONARCH MACHINE TOOL COMPANY**

**Sidney, Ohio**

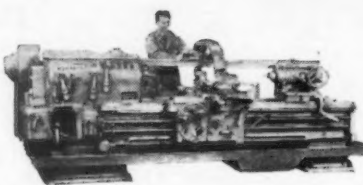
Part—Railroad Motor (Car) Axle; Material—Steel; Operations—2; Combined Time Per Piece—61.18 Min.; Combined Setup Time—26 Minutes.



**FOR SPEED, ACCURACY AND FINISH, THE MONARCH AIR-TRACER\***

1. Stepless cutting-tool motion provides a superior continuous finish.
2. Setup times averaging five to ten minutes permit profitable use for a wide variety of small-lot production jobs.
3. Automatic yet versatile operation results in economical, accurate high production.

\*Available exclusively on the new Monarch Lathes.





## Coal to Be Major Raw Material Problem in Steelmaking

### Pittsburgh

• • • Behind the peak steel production that started 7 years ago and is continuing today unabated is the struggle for coal. The war put a heavy drain on higher grade coals and the trends of the times necessitated expansion of mechanized mining. Deterioration of Pittsburgh coking coals has no doubt been hastened by the depletion of better grade coals, the extension of mine mechanization with its attendant degradation of coal quality, and the opening of new coal fields known to yield coal of high sulfur content. These are technical conditions over and above those caused by the constant demands of labor and the work stoppages that periodically stop mining and steelmaking operations.

Technologists during the war anticipated that the end of the war would see the practical end of beehive coking operations. They could not see the sustained demand for steel and foundry products that has prohibited curtailment of beehive coke production. At the present time and for some time to come, beehive operation will be maintained and production will be as great as possible.

It is the opinion of many, including some of the largest independent beehive operators, that the coke shortage at foundries next winter will be probably the most severe yet encountered. Currently, low sulfur foundry coke from beehive ovens is in very short supply in the Tri-State area of western Pennsylvania, west Virginia and eastern Ohio. Dependent mainly upon Connellsville district coke ovens, this area has a greater capacity to consume this coke than the industry has to supply it along with steelmaking demands.

To further aggravate the situation, midwestern and western consumers have come into the district and attempted, with some success, to buy coke. Shipments of foundry coke as far as the Pacific Coast and Vancouver, B.C., have been made from the Connellsville district. Thus, foundry operations face shortages of five basic commodities during the coming 12 months, any or all of which may cause shut-downs. These items are: Gas, fuel oil, coke, pig iron and scrap. Scrap is included in this list, but it is

### Beehive Coke Making Given Long Lease; New Byproduct Plants Now Building

• • •

By TOM LLOYD  
Pittsburgh Regional Editor

• • •

still difficult to determine whether or not scrap availability is not more dependent upon price than supply.

From the steel mills' point of view, adequate coke has been and still is a major problem, but some of the mills are taking direct steps to rectify the situation. On Dec. 31, 1946, there were some 15,307 byproduct coke ovens in the United States, 11,667 of which, incidentally, were either Koppers or Koppers-Becker ovens. On the same date, there were 752 ovens under construction, 575 of which were Koppers or Koppers-Becker types.

Because coal and coke is one of the major problems to steelmaking and foundry operation in the Tri-State area, it is interesting to note that of the 752 byproduct ovens under construction, 517 were in western Pennsylvania and West Virginia and another 177 are under construction at Lorain, Ohio. Thus, the Tri-State area and Lorain, Ohio, account for 694 of the 752 byproduct coke ovens now building.

The National Tube Co.'s byproduct coke expansion at Lorain, 177 ovens, is the largest job under way, and will increase the coking capacity of the plant by 800,000 tons a year. Currently, the plant has 208 ovens, rated at 850,000 tons a year, so that when completed the Lorain Works will be able to produce 1,650,000 tons a year. It is likely that, should conditions warrant, some of this will be used to supplement American Steel & Wire Co.'s capacity. The wire company now has 180 ovens at Cleveland,

### Old King Coal



rated at 874,000 tons a year.

Carnegie-Illinois Steel Corp. at Clairton is replacing two batteries of coke ovens with 174 new ones. Before the work started the company had 1482 ovens rated at 7,457,000 tons of coke a year. There will be 174 ovens replaced, but company officials indicate that capacity will not be increased. One battery of new ones is in operation and another is yet to be completed.

Weirton Steel Co., at Weirton, is discarding 25 of its present 156 ovens and building 106 new ones, bringing the total number of ovens to 237 with an annual capacity of 1,400,000 tons of coke. Currently, the capacity is 920,000 tons. Weirton operates some 140 beehive ovens at its Isabella Mine, and these ovens will be kept in operation as long as conditions warrant.

Jones & Laughlin Steel Corp., at Aliquippa has torn out a battery of 59 ovens and is replacing it with 106 new ones. Another battery of 59 ovens will at some subsequent time be completely rebuilt, but until then the 1,224,000 tons a year coking capacity figure will stand.

Wheeling Steel Co. expects to have in operation about May 1, 1948, 106 new ovens which will be rated at 600,000 tons of coke a year. Currently, Wheeling has 145 ovens in operation, making about 700,000 tons of coke a year.

Crucible Steel Co. of America, at Midland, Pa., has 100 ovens that produce about 475,000 tons of coke a year and it is now building 21 ovens. Company officials indicate that the addition of these ovens will not boost the capacity, since the company intends to increase the coking time in order to improve the quality of the coke. However, still

in the planning stage is a program that may eventually result in the addition of more byproduct coke ovens at Midland, which should increase the coking capacity of the plant by about 50 pct.

Along with the actual construction of new byproduct coking facilities, there is a tremendous amount of coking facility modernization and rebuilding in progress. Many of the steel producers that have no plans for building new capacity are undertaking the rebuilding of existing facilities. While there were 15,307 byproduct ovens in the United States at the end of last year, some 3413 of these were from 28 to 35 years old. There were a far greater number between 15 and 28 years old. Consequently, much of this capacity is in need of repair and this work is being done.

Some companies are shying away from new construction at the present time primarily because of cost. Republic Steel Corp. has been contemplating another battery of ovens, but the program is still in the "talking" stage. Whether the company will go ahead with the plan depends specifically on how the steel industry hews to present operating and demand levels and the trends of costs.

Costs are up—of that there is no question. A byproduct battery in 1917, according to one mill official, cost \$1 million and that same battery today, with technological improvements of course, costs closer to \$3.5 million. Many byproduct coke batteries have been depreciated on the prewar basis and consequently it would cost \$5.5 million to build a battery that would yield 35 to 40 pct more coke

than one built in 1917, he pointed out.

Republic is currently getting some 30,000 tons of beehive coke a month, and will continue to operate the beehives rather than pay the current high prices of byproduct oven construction. Republic currently has 62 byproduct ovens at Canton; 279 at Cleveland; 49 at Massillon; 125 at Warren; and 212 at Youngstown, with a coking capacity total from these plants of 3.6 million net tons a year.

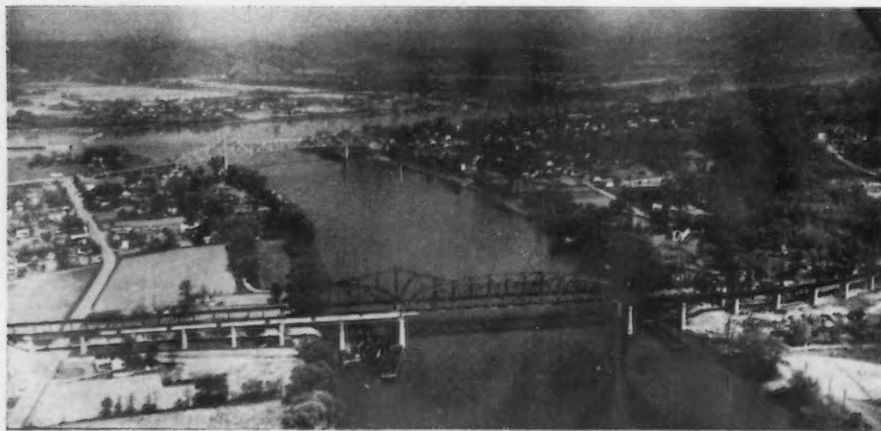
Youngstown Sheet & Tube Co. officials indicate that no expansion of byproduct coking capacity is anticipated. At its Campbell and Youngstown plants, both in eastern Ohio, there are at present 390 ovens with an annual capacity of 1.7 net tons of coke.

Supplementing the steel producers' byproduct coke supplies are the beehive ovens. In the western Pennsylvania area there are some 10,000 beehive ovens still in operation. Republic's beehive coke, 30,000 tons a month, comes substantially from its Brownsville, Pa., ovens. J&L, from 296 rectangular type beehive ovens at Aliquippa, gets 215,000 tons of coke a year. Pittsburgh Steel Co., in addition to its 500,000 tons of byproduct coke a year from 74 ovens, operates or controls the output of 510 beehives at Republic, Pa., capable of producing 400,000 tons of coke a year. Weirton, as previously mentioned, has 136 beehives at Isabella Mine, rated at 120,000 tons a year. H. C. Frick Coal & Coke Co., the coal producing subsidiary of U. S. Steel, operates 4400 beehives in western Pennsylvania, adding 3 million tons of coke a year to the corporation's supplies in this area.

There are few beehive operators that do not have a steel mill tie-up. Consequently, with mill demand so high at present, the small user finds his job of obtaining coke doubly hard. Hand drawn ovens, which normally supply foundries, are getting fewer, while the machine drawn ovens that primarily produce furnace coke shy from foundry business. Foundries, in addition to having trouble finding the coke, are also having trouble on coke quality. They take what they can get, when they can get it, and sweat out the difficulties that arise from small coke particle size, high sulfur and irregularities in grading.

Thus, despite byproduct coking expansion, there will remain a coke

**B & O IN OHIO:** The Baltimore & Ohio R.R. recently opened a new \$2 million bridge, foreground, at Point Pleasant, W. Va., one of 18 bridges along the road's Ohio River subdivision that have been rebuilt to handle heavier freight between the Great Lakes and Pittsburgh.





shortage until present steel demand eases. As one mill executive stated, his company is building a new by-product capacity, but the beehives may be operated for quite a few years yet.

Along with the expansion of coking facilities the question of coal cleaning is becoming more and more important. Mines, in order to get the tonnage of coal necessary, must go in for mechanical handling and loading. Mechanical loading yields coal that is two to five times as dirty as hand loaded coal, making coal cleaning imperative. Currently, Carnegie-Illinois, Hillman Coal & Coke, Weirton Steel, Jones & Laughlin, Pittsburgh Consolidated Coal, Terminal Coal, and others, operate washers in this area.

Upward of \$50 million will be spent on new coal cleaning facilities in western Pennsylvania during the coming 5 years. Some of these facilities are in the planning stage, others have been engineered and contracts placed, and some are under construction. U. S. Steel has a 10,000 ton a day, heavy medium sink-float separation washer under construction at its new Robena mine, with two more similar units contemplated. At its Gary, W. Va., mine, the corporation is building a 25,000 ton a day water washer, which will be completed about the same time as the washer at Robena mine.

Pittsburgh Consolidation Coal, which now operates six coal washers at various of its mines, is planning another 7000 ton a day unit at its Mathies mine at Monongahela. Likewise, J&L will supplement its Pittsburgh and Aliquippa washers with cleaning capacity at its mines. This new washer will likely be at Vesta No. 5 mine and handle coal from both Vesta No. 4 and Vesta No. 5.

The problem here is whether to build one large washer of perhaps 25,000 tons a day capacity, and haul coal from Vesta No. 4 to the washer or build two small washers, one at each mine. Also, there is in the planning stage a plant in the Pittsburgh area that will handle 45,000 to 50,000 tons of coal a day, which would be a multiple section plant having lower capacity units in parallel.

Engineers of coal washing equipment are trying to emulate the system used in copper concentrators. This will result in one main

coal feeding system that breaks up into a series of parallel washing units, permitting continuous operation of the washing equipment, even though single units in the system might go down for repair. Processes in coal handling are getting continually more complicated and efficiency is so important that continuous rather than intermittent operation of equipment is vital.

Pittsburgh area coal operators are emphatically going over to coal washing as are the coal operators in Alabama. Not only the removal of dirt from the coal, but the removal of sulfur is becoming increasingly important, especially with the opening of new coal fields in western Pennsylvania where it is known that sulfur content of the coal is high. Alabama coal is high sulfur coal, so that coal washing

is vitally important in that area. One of the most pronounced benefits of washing coals is the marked improvement in the uniformity of the coke ash and the sulfur content.

Further, while the total oven yield from washed coals is minutely less than from unwashed coals, the furnace coke yield is somewhat greater. Total coke yield includes as well as furnace coke, the coke dust and the quencher sump sludge. As to byproducts, tests have shown that generally the yield of byproducts from washed coals is slightly higher than from unwashed coals. These increased yields alone do not justify washing, but dirt and sulfur removal are necessary and it is because of this that coal washing, technologically and capacity-wise, is so important.

### Okays Recommendation For Galvanized Ware

Washington

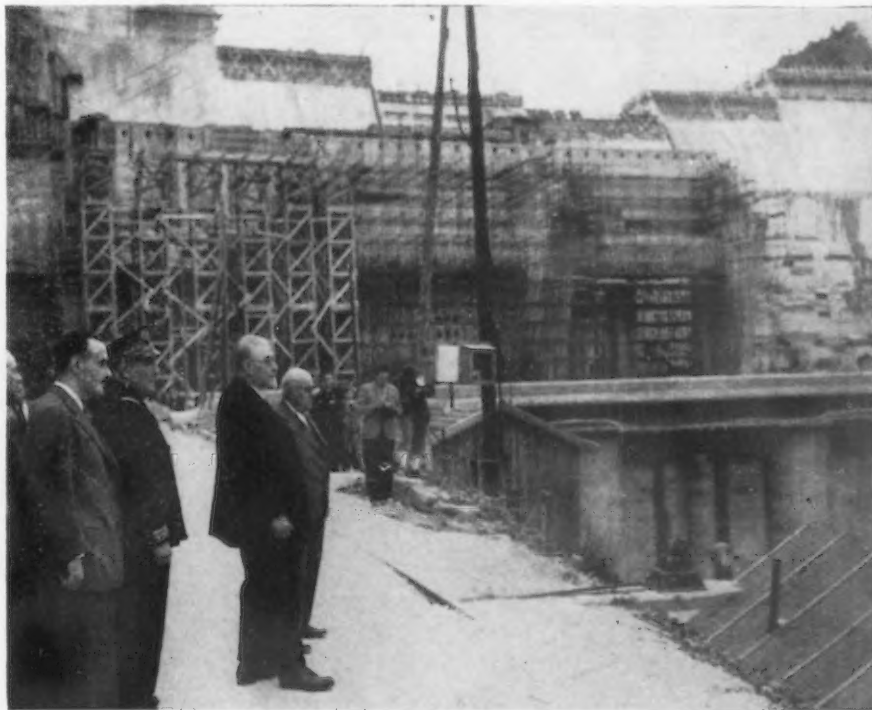
• • • A voluntary simplified practice recommendation for standard-grade galvanized ware has been approved, according to an announcement of the National Bureau of Standards.

The recommendation, which had its beginning in a proposal of the Galvanized Ware Manufacturers

Council, concerns the capacities or dimensions of both hot-dipped and sheet-construction types of standard grade galvanized ware. The items included are: water pails, fire pails, well buckets, round tubs, square tubs, baskets, coal hods, sprinklers, garbage and ash cans, garbage pails and grain or feed measures. Heavy and extra heavy grades of galvanized ware are not included.

Effective July 1, 1947, it is identified as R226-47.

**DAMMING THE RHONE:** Premier Ramadier of France visits the construction of the Genissiat Dam, to be one of the world's largest. France is pressing forward with hydroelectric developments to diminish its needs for imported coal.



## Roads Ask Freight Rate Boost Averaging 16 Pct; Seek 25 Pct in the East

Washington

• • • The railroads of the United States last week petitioned the ICC for increases in freight rates averaging 16 pct for the country as a whole to yield approximately \$1,091,000,000 a year on the basis of 1947 estimated traffic.

The increases asked for vary in amount in the different territories. In Eastern territory, and on inter-territorial movements involving the East, the request is for 25 pct, while in the Western and Southern territories, and on inter-territorial movements between them, it is 15 pct. These percentages are reduced, however, by limitations to specific maximum increase on a list of commodities, so that for the country as a whole, and taking all commodities in account, the increases asked for average 16 pct.

On iron and steel products, pig iron, and iron and steel scrap the general percentage increases are limited to a maximum of 7¢ per 100 lb but not in excess of \$1.40 per ton, net or gross as rated. The increase on iron ore would be 15¢ per net ton, net or gross as rated, applied to all rates. Charges for handling iron ore at Lower Lake ports would be increased 10 pct. No increase is proposed for storing iron ore at Lower Lake ports.

On bituminous coal the increase

would be 15¢ per net ton, except that a 25¢ per net ton boost would apply to tidewater coal for transshipment by vessel to foreign countries other than Canada and Mexico and foreign bunker coal. The increase on coke and anthracite coal would be 10¢ per net ton where the present rate is 75¢ per net ton or less; 20¢ per net ton where present rates are from 76¢ to and including \$1.50 per ton; and 30¢ per net ton on rates now over \$1.50 per ton.

Other commodities on which the increases proposed are limited to maximum amounts are 40¢ per net ton on sand (including foundry), but not less than 20¢ per net ton; dolomite, crude, not roasted, 20¢ per ton; roasted dolomite, 50¢ per ton; slag, 20¢ per ton; fluxing stone 20¢ per ton; crude sulfur, 1¢ per 100 lb; and cement, 6¢ per 100 lb.

The increases asked for, according to the railroads petition, are necessary to "bridge the gap" between present revenues and increased costs which already are in effect, and have no relation to any increase which might come about in railroad wages or fuel costs, as a result of pending wage discussion, or in the prices of materials. Nor are the rehabilitation or modernization programs taken into consideration.

On the basis of 1947 levels of traffic, costs, rates and fares, the petition estimates that the railroads will have a net railway operating income of about \$800 mil-

lion, representing a return on net property investment of about 3½ pct. Such a return, the petition said, is not sufficient to enable the railroads "to provide the adequate and efficient transportation service provided by law."

Of the total estimated yield of \$1,091,000,000 a year, it is estimated that \$494 million would be received by railroads in the Eastern District, \$38 million in the Poca-hontas Region, \$137 million in the Southern Region, and \$422 million in the Western District.

In addition to changes in freight rates proper, increases are also asked applying to various accessorial services, such as refrigeration and heating, switching, pick-up and delivery, diversion and reconsignment, and other special handling charges.

## Tool Steel Prices To Go Up August 1

Pittsburgh

• • • The rise in price of tungsten and ferrotungsten has forced Firth Sterling Steel and Carbide Corp., Pittsburgh, to advance its prices, effective Aug. 1, on tungsten high speed steels. New prices on some widely used grades are: 18-4-1 high speed steel, 82¢ a lb; 18-4-2 now 93¢ a lb; 18-4-1 with 5 pct Co, now \$1.29 a lb; 18-4-2 with 8 pct Co, now \$1.53 a lb; 14-4-2 high speed steel now 80¢ a lb; 14-4-2 plus 5 pct Co, now \$1.29 a lb; 16 pct tungsten hot work with nickel, now 80¢ a lb; 18-4-3 high speed, now \$1.04 a lb; fast finishing, carbon over 1 pct, tungsten and or moly, 3 to 6.5 pct, chromium 0.15 to 2 pct, with or without vanadium, now 55¢ per lb.

## Seeking Generating Machinery in Germany

London

• • • Discussions have been proceeding in Germany with a view to bringing German generating equipment to Britain to ease the electricity supply position, but no real progress appears to have been made, either by a purchasing mission which has been operating in Minden or in the way of reparations. Of an allocation of about 6,000 tons of German plant, Britain has so far received 1,800 tons, mostly heavy machine tools, which have been sold to private firms.

**TAKES PAPA TOO:** Mrs. R. Richard Jenner of Wichita, Kan., wife of one of the inventors of the "Airscoot," takes the tiller of the 72-lb single cylinder "car" for the run from the plane to the airport administration building. It will carry 450 lb and folds for stowing in a private plane.





## Metal Consuming Plants Drive for Balanced Inventories

### Chicago

• • • Intensive efforts on the part of metal consuming plants to achieve a better balance in supplies has been the keynote during the past month. This battle of inventories seems to be country-wide, and in contacting the trade, the situation appears to be of paramount interest in every manufacturing field. With production governed by items in short supply, industrial buyers are now drastically restricting their purchases and stocks of all materials to the available supply of flat-rolled steel products.

Worry over inventories was typically expressed in General Electric Co.'s form letters dated late in May, that were sent to all suppliers and all producing divisions of the company. In these letters the company cautioned against a supplier anticipating deliveries, warned about overshipments and generally implied to their outlying plants that a 60-day maximum inventory was the law. Some of the automobile companies in Detroit have advised their subsidiary branches in this area that a 30-day inventory is the most they will tolerate, and in some cases particular materials are confined to a 5-day supply.

Better balance of stocks on hand is a must to most metal consumers. Companies, particularly smaller organizations, have found that the cost of carrying excessive stocks at the present high price level can quickly bring them to the brink of financial difficulty. Banks are constantly getting tougher on loans. The unprecedented industrial loan rise experienced since VJ-Day leveled off 60 days ago. Interest rates have recently firmed. The exceptionally pessimistic or bearish attitude expressed by many Chicago bankers in the last month does not seem to be too well founded as far as recession possibilities are concerned. However, their attitude on credit has decidedly influenced the would-be borrowers to the extent that every effort is being made by manufacturers to stay solvent at almost any price.

### Large Companies Keep Close Check on Stocks: Advise 60-90 Day Inventory

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By D. I. BROWN  
Chicago Regional Editor

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Observers here declare that the widespread caution in buying materials to be fabricated into other products will shortly reflect easing in certain steel supplies, but this opinion is not universally held. The difficulty in steel products is that the easing in these products does not improve the overall position or necessarily permit greater freedom of operation. Steel castings, for instance, have eased considerably since April but a plentiful supply of castings does not mean a higher production rate if cold-rolled strip or sheet is also included in that product. Fractional horsepower motors, although still tight, are better, according to two household goods makers in this area. Here again, more motors aren't any help as enameling steel sheets are still scarce.

Next to sheets, carbon rods  $\frac{1}{4}$

in. and under are the most difficult items to secure of the popular basic products. Products made from this stock are therefore equally tight. One large maker of heavy industrial and railroad equipment in Chicago told THE IRON AGE that of all the items in short supply, self tapping machine screws and allied products  $\frac{1}{4}$  in. and under were the tightest items. This company is a large user of many special electrical controls, motors and practically all ferrous and nonferrous material.

Small independent manufacturing firms do not agree with the recent statements made by the leading steel makers, that the industry's capacity to produce steel is sufficient to meet the country's needs. These manufacturers maintain that it is not possible to make a stove or an automobile fender from an ingot. They say that possibly the ingot capacity is sufficient, but the conversion facilities for producing sheet and strip from those ingots is far from being ample.

That the battle of better balance will be won by manufacturers struggling with lopsided supplies is a foregone conclusion. This effort, observers here declare, will eventually affect the demand for all steel products. Carbon bars

**CONSIDERABLY COOLER:** This Blaw-Knox pre-assembled all steel building is going up for a Pittsburgh truck rental firm. The steel construction is said to be more economical because of reduced labor costs and the steel roof. Treated insulating sheets are reported to have an insulating value 55 pct higher than that of an 8-in. concrete block wall.



can go wanting indefinitely, Chicago plants say, if the flat-rolled supply doesn't get better. One large purchaser of many different materials used in the manufacture of electrical goods, told THE IRON AGE that in his opinion the unbalanced inventory situation has been overstressed.

This executive pointed out that the steel industry's ability to produce all types of products is even more unbalanced than are consumer inventories, and this deficiency is the basic cause of the present consumer condition. Before any substantial improvement can be made, aside from just cutting back on items in long supply, this official declared the only real remedy was a better balanced production by basic steel producers.

Many consumers appreciate that the installation of new sheet and strip mills is a long time project, particularly under present conditions. For this reason they have been busy trying to work out substitutes until the flat-rolled delivery picture improves. One maker of roller bearings here is conducting extensive research in the attempt to substitute aluminum for cold-rolled steel strip used for retainer rings. One large construction company told THE IRON AGE that some projects are a year behind schedule because of the shortage of light plates. This com-

pany last week decided to redesign the structures around reinforced concrete and forget about the plates.

Many manufacturers, however, find that the cost of changing designs and materials prevents their trying to help themselves. Such plants have no alternative but to limp along on a reduced schedule,

under the rigid economy program, hoping that the next month will see better flat-rolled deliveries. None of the mills in this area offers any encouragement in these items. Along with flat rolled, the pipe mills repeatedly warn that small steel lap and butt welded pipe will continue to be scarce for months, or even years to come.

### Moving-In Date For Machine Tool Show Advanced to Aug. 4

Cleveland

• • • The date for the moving of some \$16,000,000 worth of machine tool exhibits into the Dodge-Chicago Plant for the 1947 Machine Tool Show has been advanced from Aug. 25 to Aug. 4, according to the National Machine Tool Builders' Assn.

This will provide an extra 3 weeks for the immense task of moving in, setting up, and placing in full operation the vast number of machine tools and other metalworking equipment which will comprise the world's greatest machine shop in a 9-day working demonstration. The show will be open daily, except Sunday, from September 17th to 26th. It will cover more than 500,000 square feet of space, approximately 12

acres, in the Dodge-Chicago Plant in Chicago, the huge industrial facility now occupied by the Tucker Corporation.

The number of exhibitors has grown to more than 275 for this fourth Machine Tool Show to be sponsored by the N.M.T.B.A. The three previous shows, 1927-1929-1935, were held in Cleveland.

In addition to more than 150 Association members who will exhibit the latest developments in machine tools, forging machines, and other metalworking equipment, there will be approximately 125 manufacturers of related equipment, including cutting tools of all kinds, measuring instruments, attachments and accessories, and some trade publications serving the metalworking industry.

Many of the machine tools shown at this first show of its kind in 12 years will be entirely new in design. Others will be long-tested machines with new attachments and applications. One exhibitor will have 29 machines, all new in size, capacity, or application. Another will have 28 models and types, some entirely new in principle. A third will show 27 machines, many of them new. The seven machines to be shown by another exhibitor will have a gross weight of 400,000 pounds and a value of \$325,000.

### Forms Plumbing Firm

Montreal

• • • Crane Ltd. has been granted letters patent for another subsidiary company, to be known as Crane Steel Ware Ltd. The new company will manufacture enamelled pressed steel bathtubs, sinks and other plumbing fixtures in a plant recently purchased from the City of Quebec, formerly used by the Canadian Arsenal during the war.

**BOOM FOR STEEL MILLS:** The boom of this 14-in. Army railway rifle which once broke so many windows in the San Pedro, Calif., area that it was test fired only once will never again be heard. Along with companion pieces in Ft. MacArthur batteries it is headed for the openhearth. Dan Hansen & Son are cutting them up for scrap.





## Retirement Pensions May Become UAW's Main Objective

### Detroit

• • • The possibility that retirement pensions for hourly employees may become the No. 1 objective of auto workers' unions has been raised in Detroit by the announcement that Ford Motor Co. and the UAW-CIO have agreed to a pension plan for all hourly rated Ford workers.

Full details of the Ford pension plan have not yet been agreed upon, according to a joint announcement by Ford and the UAW-CIO.

While the announcement of the Ford pension plan has been hailed by Richard T. Leonard, director of the National Ford department as "the first pension plan in the auto industry for hourly-rated employees," it has been disclosed that since Apr. 1, 1947, General Motors hourly workers in Canadian plants have been included in a retirement plan.

In the case of the GM Canadian workers, however, the plan was not arrived at by negotiations between the company and the union. The retirement plan in effect for GM Canadian workers is similar in many respects to the retirement plan available to certain GM officials and salaried employees in U. S. plants. Some sources believe a similar offer to GM hourly workers in U. S. plants is being considered by GM management.

It is not believed that the GM wage agreement with the union will be reopened this year on the strength of the recent Ford pension announcement. It is known that a worker's retirement plan was included in the original demands of the UAW-CIO on General Motors. However, this demand was dropped following the wage agreement signed by the United Electrical Union and GM. Walter Reuther, UAW-CIO president has long advocated a retirement plan for hourly-rated auto workers.

Some sources believe that Richard T. Leonard, UAW-CIO vice-president, may oppose Walter P. Reuther for the UAW-CIO presidency in the fall election on the strength of his success in negoti-

### Ford's New Plan Estimated By the Union to Cost Over \$200 Million

• • •

By W. G. PATTON  
Detroit Regional Editor

• • •

ating a pension agreement with Ford. This is not a certainty, however.

Ford has made no official announcement as to the cost of the new retirement plan to the company. According to union sources, the New Ford contract provides for a 7¢ across-the-board wage increase and an additional 5¢ wage increase for 10,000 maintenance workers and coremakers and jobbing molders. The wage increases are retroactive to May 31, 1947.

The retirement program becomes effective as of Jan. 1, 1947, according to the union. Union statisticians estimate that the retirement plan alone will involve an expenditure of more than \$200 million by the Ford Motor Co.

"for past service benefits alone." Major provisions of the Ford retirement plan are as follows:

Each Ford worker on retirement will receive one pct of his pay times the number of years in service. This is in addition to Federal Social Security benefits.

In the event of death, all employee contributions plus interest will be payable to the employee's beneficiary.

Total and permanent disability payments will be made.

Each Ford worker will have full vested rights in his contribution and partial vested rights in the company's contribution after a specific number of years.

No definite retirement age has been set, although it is believed this will be somewhere between 55 and 65 years of age.

According to union estimates at least 95 pct of all Ford workers will be eligible to participate in the pension plan at once. The union claims Ford's contribution to the pension plan will amount to approximately 17½ pct of its payroll or 14¢ an hr. This is in addition to the 7¢ hourly wage in-

**FUEL INJECTION:** One feature of this 150-hp engine which will reportedly power the Tucker Torpedo is a fuel injection system, foreground, and six individual exhausts. Mr. Tucker has hurdled his difficulties with the SEC for the present as well as the WAA. Only production, sales and possibly additional financial headaches are ahead. The demonstrator is a Mr. Armstrong.



crease that will go in the employee's pay envelope.

In addition to a total cost of \$200 million, the union estimates that Ford's annual contribution to the retirement fund will amount to approximately \$15 million.

There is some interesting but little known background behind the present Ford labor negotiations.

After a number of bargaining sessions which Richard T. Leonard, director of the national Ford department described as "fruitless," Mr. Leonard is quoted as saying: "The national Ford negotiating committee regrets to report that negotiations with the Ford Motor Co. have not, to date, progressed in a satisfactory manner."

"The committee has had ten bargaining meetings with the company's representatives. Our efforts thus far have been vainly expended in an attempt to establish a fair and equitable procedure for negotiating the issues at hand. . . . The union's efforts to arrive at a mutually satisfactory basis for negotiation have been stymied by the company's counter-proposals."

After rejecting Ford's offer of 11½¢ and six paid holidays which he described as "a short change proposal that contained a stipulation that there would be no further negotiations concerning an old age pension plan or social security benefits," Mr. Leonard took the position that no wage offer by the company would be considered acceptable if it did not contain an old-age retirement system.

"This is the No. 1 demand on the agenda of the negotiations with the company," Mr. Leonard said, "and it will remain our No. 1 demand."

It is reasonable to believe that the new Ford agreement with the UAW-CIO may establish a new kind of "pattern" for the automotive industry. Many observers here are inclined to believe that pensions will now become a No. 1 item in future UAW-CIO wage demands.

This is confirmed by the union which has stated: "The achievement of a good pension plan in our agreement with the Ford Motor Co. will lay the basis for other workers in our industry and, indeed, all other industries to get

these benefits. In our case, it also lays the basis for improved and extended benefits in this and other fields of protection and security."

According to the union, a Ford worker earning \$200 a month would contribute approximately \$1800 in 30 years to the retirement fund. At retirement he will receive a total of \$100 a month.

According to Mr. Leonard, \$55 of this \$100 will be purchased by the company, the balance by the employee. He asserts that an individual annuity would cost the worker approximately \$9000 with the return of only about \$55 a month.

Various explanations have been offered for Ford's surprising move in agreeing to a retirement plan for its hourly-paid workers. One explanation is that in the final analysis the total cost to Ford of 7¢ wage increase plus the creation of a retirement fund may actually be less in the long run than a wage increase that has to be paid out now and might constitute a severe drain on Ford's cash reserves.

Another explanation would be that the Ford pension plan was another demonstration of Henry Ford II's sincere desire to improve the lot of hourly-paid Ford workers.

## Industrial Class Graduates

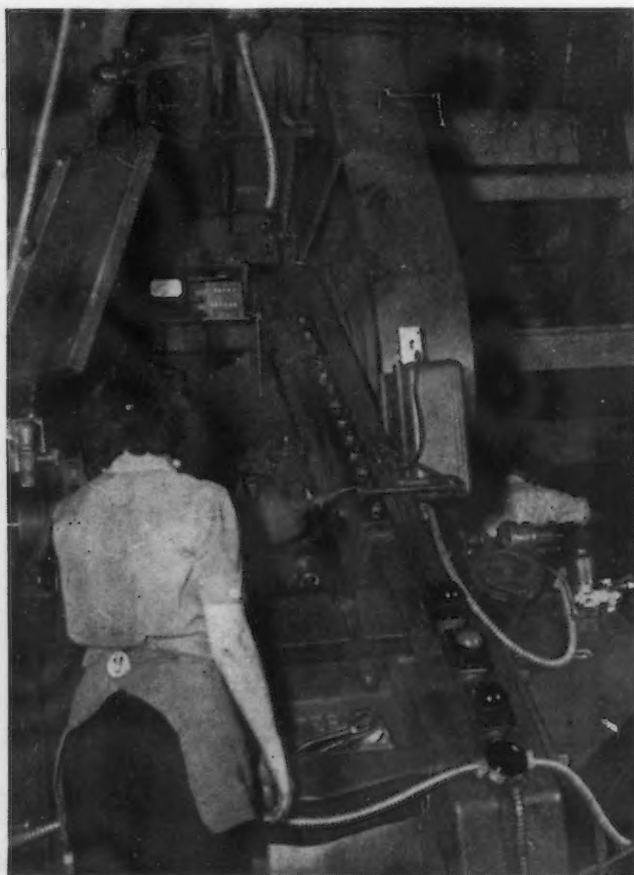
Washington

••• A class of 96, including 68 Army officers, 26 Navy officers, and two Marine Corps officers, was graduated from the Armed Forces Industrial College recently. Training involved all aspects of economic warfare, industrial mobilization planning and related subjects. The class was addressed by Bernard Baruch, governmental adviser for both World Wars.

## To Erect New Mill

London

••• Darlington & Simpson Rolling Mills, Ltd., are raising \$2,703,000 of new capital to finance their new small-section mill. The company is controlled by Crittall Manufacturing, metal window makers, and Dorman, Long, of Middlesbrough.



BY ITS BOOT-STRAPS: Using its own all electric, adjustable speed V-S drive, Reliance Electric & Engineering Co., Cleveland, trebled output of rotor and stator laminations for its electric motors. The drives were installed on three of the latest type Minster inclinable punch presses. They permit changing the press operating cycle from semi- to full-automatic with the same dies and stock to take advantage of the full range of 30 to 120 strokes per min made possible with the new drive.



## Weekly Gallup Polls . . .

### Analyzes Wallace's Following on Third Party Sentiment

Princeton, N. J.

••• The Wallace third party threat is not a unique phenomenon in recent American politics nor does it represent a groundswell of popular protest, judging from public opinion, according to George Gallup, director, American Institute of Public Opinion.

Within the past decade there have been several third party boomlets with approximately the same political support as a third party formed by Wallace would likely get today. Such a third party would, at present, draw support from a little over one tenth of the voters.

Nevertheless, its importance as a threat to Democratic chances to win the presidential election next year should not be underestimated. If the new party were able to get on the ballot in key areas, such as the big cities, it could prove acutely embarrassing to the Democrats. For the Wallace party if formed would draw about five times as many converts from the Democratic ranks as from the GOP.

The popular appeal of such a party was measured in a 48-state survey by the institute in which interviewers questioned a cross-section of voters on the following:

"If Henry Wallace starts a new liberal political party, do you think you would vote for the presidential candidate of that party in the next election?"

	Pct
Yes . . . . .	13
No . . . . .	68
No opinion . . . . .	19

The 13 pct is made up of 10 pct who say definitely that they think they would support a Wallace party, plus 3 pct who say they probably would, depending on its policies and other factors.

How does this compare with other third party movements in the past?

In 1944 in New York State the American Labor Party-Liberal Party ticket polled 13 pct. Two years before that the American Labor Party candidate for governor of New York polled 10 pct.

Shortly before our entry into World War II, a poll by the institute found 16 pct of the country

willing to join a Keep-Out-Of-War Party if one were founded. In 1938 when Robert and Philip LaFollette of Wisconsin announced their intention of starting a National Progressive Party, 1 out of every 11 voters who had heard of the party wanted to join it. In 1935, when Huey Long's fame was at its height, 10 pct of voters questioned by the institute indicated sympathy with a third party.

In short, the Wallace figure of 13 pct compares closely with the average of recent years. Going back to 1924, Robert LaFollette, the elder, polled 17 pct of the total vote for president. But that was far below the performance of Theodore Roosevelt's Bull Moose ticket which polled 27½ pct of the total vote in 1912.

Today's survey reveals these important facts about the type of voters to whom a Wallace third party would appeal:

(1) One in five (19 pct) of the people who voted for Roosevelt in 1944 say they would support the new party. If they actually did it would mean some 5 million votes—but only if the new party succeeded in getting on the ballot in all states, which is unlikely.

(2) A Wallace party would draw its strength more from labor union members than from any other major group. Among union members polled, 22 pct say they would be for such a party.

It would have least appeal to farmers, despite the fact that Wallace has a farming background, and served as Secretary of Agriculture as did his father before him. Only 6 pct of farmers in today's poll say they would support a Wallace party.

(3) It would appeal more to young voters, especially veterans, than to the middle-aged and elderly.

(4) People who say they would support a Wallace third party have very different ideas from the rest of the country on Russia and on labor legislation.

They favor a softer policy toward Russia than the rest of the country, and a majority of Wallace supporters familiar with the Taft-

### Large Majority of Workers Throughout Country Prefer To Have Their Own Business

o o o

Hartley bill were opposed to it, whereas among the general public the measure was approved by those who had heard or read about it.

Analysis of the views of Wallace followers on labor and on foreign policy illustrates not only part of the reason for his following, but also some of the basic conflicts within the Democratic Party.

Among Wallace's followers the two viewpoints—liberal treatment of unions and a softer policy toward Russia—are not necessarily held by the same people. In fact, sympathy for labor unions is found widespread among groups of low economic status, where there is a pronounced anti-Russian sentiment. Wallace's problem is how to keep in line the followers who don't agree with each other about the two subjects—labor and Russia—on which he has taken a forthright and much dramatized stand.

••• The American ideal that every worker can one day own his own business still has powerful appeal throughout the country.

In spite of the popular drive of the last decade for security, two out of every three people polled by the institute say that they (or the menfolk in their family) would prefer to own their own business and assume all the risks, rather than work for someone else and let that person take the risks.

The extent to which the idea of going into business for oneself appeals to the American population is seen in the following survey:

"If you could have your choice, would you prefer to own your own business (or have your husband own his) and assume all the risks—or would you prefer to work for someone else and let that person assume all the risks?"

(CONTINUED ON PAGE 127)

## Metalworking Industry Gets Real Benefit From Atomic Pile

### Washington

• • • The metalworking industry now benefits from peacetime applications of atomic energy through its use of radioactive tracers. High on the list of other so-called peacetime applications is the prospective use of atomic energy as a source of electric power. While the U. S. Atomic Energy Commission is able to point to specific tests with the former, it says the latter may be 10 to 15 years away. It hastens to add, though, that that estimate is only an "educated guess."

Under the terms of the Atomic Energy Act the U. S. Atomic Energy Commission is charged with keeping America on top in the field of atomic weapons. But its work in making available to the nation as a whole the benefits of atomic energy—thereby adding to the country's economic and industrial potential—is sometimes a little obscured.

Specifically, good results have already been obtained in both industrial and academic research

### Oak Ridge Lab Sells Isotopes For Iron, Steel Testing; Power Use Remote

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By GENE HARDY  
Washington Editor

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laboratories by using newly-discovered materials which are sold by the Isotopes Branch of the Atomic Energy Commission at Oak Ridge, Tenn. Three types of material are now being allocated under stringent rules: Radioisotopes—used in industry and the medical sciences as tracers; heavy water—also a tracer but more useful in regard to organic matter; and boron 10—used in the manufacture of radiation detection instruments. Heavy water and boron 10 are not radioactive in contrast to the more than 90 different radioisotopes now available.

These radioisotopes represent

variations of more than 50 different elements, ranging from antimony to zirconium. In cost they range from \$9 per minimum unit for samarium 153 to more than \$2000 per minimum unit of europium 154. The minimum units are measured in small amounts of millicuries ( $3.7 \times 10^7$  disintegrations per sec.).

Simply stated, the radioisotopes are formed by inserting the material to be made radioactive in a chain-reacting uranium "pile." During the period the material remains in the pile it is bombarded by neutrons, resulting in either transmutation or transmission of radioactive properties to the original material.

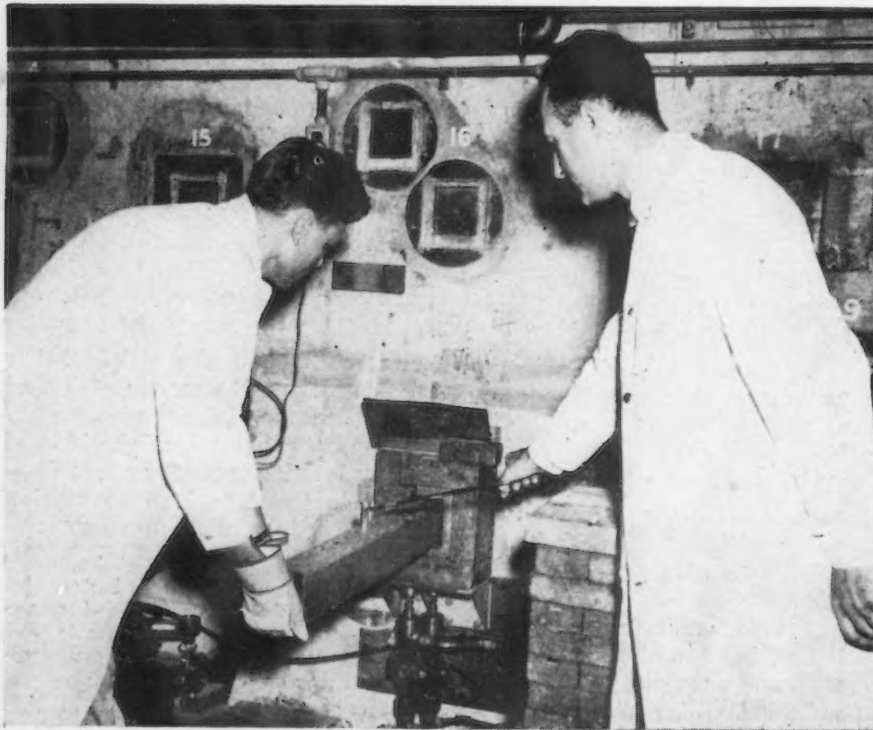
They represent the first concrete peacetime contributions from the release of atomic energy. While very limited quantities of radioisotopes had been produced in cyclotrons before the war, it remained for the creation of the uranium pile to make possible something approaching mass production, even though this method is not the perfect one.

The field of production and utilization of radioisotopes is the first in which security has been lifted and a policy laid down that such information can be widely disseminated. From a security standpoint, radioisotopes are dangerous in regard to health but are not capable of being made into an explosive or power reactor.

The tremendous utility of the radioisotopes lies in the fact that while they are chemically identical with the stable forms of the elements they are radioactive, and the radioactivity can be detected. Thus, a minute quantity of one of these isotopes can be followed through any physical or chemical process and still be certainly identified. Because of the extreme sensitivity of radiation detectors, radioisotope tracing has already solved problems which could not be solved either by chemical or spectrographic analysis.

Already, quantities of these radioisotopes have been allocated to various industrial and academic research laboratories for use in metallurgical research. For

**BOMBARDMENT BEGINS:** The physicist at the left holds a graphite carrier block while a sample of material to be activated is inserted into one of the holes in it. The carrier block is then pushed into the uranium pile, which is not operating while the sample is being charged. Concrete protective wall surrounds the pile and lead bricks, add insulation.





example, Carbon 14, one of the most commonly used radioisotopes, is now being used in a study of the diffusion of carbon in pure iron during aging. The same isotope is being used in another laboratory in an attempt to set up micro-radiogram methods for studying the disposition of carbon in iron and steel. It is also being used in still another case for a study of the concentration, ingredients and effects of pressure on the diffusion of carbon in iron.

Sulfur 35 is being used in a study of the kinetics of electro-structure and activity of sulfur in iron. It is also being used in a study of sulfur in slag to determine what fraction of the sulfur goes into slag, what fraction of it goes into the melt itself, and whether it is an occlusion.

Chlorine 36 is being used in a study of chlorine absorption in stainless steel from salt solutions.

Calcium 35 is being used in an attempt to determine the deoxidation constant and to study the kinetics electro-structure of calcium in iron.

Titanium 51 is aiding in the rapid determination of titanium in ferrous alloys.

Iron 59 is being used in a study of the self-diffusion of solid iron and also to trace the diffusion and crystallization of iron in al-nickel alloys as well as to investigate the magnetic domain of such alloys.

**Applications for radioisotopes** must be made to the Isotopes Branch of AEC at Oak Ridge. Applicants must prove their ability to handle the materials, from a standpoint of health and security aside from their ability to utilize the material in research projects. Allocations will not be approved unless the results of the project are to be published and made freely available. In addition, a complete report must be furnished AEC within 6 months after completion of the project. Sold at a price equal to the cost of production, the materials are shipped by train or aircraft. Air transport is used entirely for those radioisotopes having a very short life. Actually, the effective life of some of the isotopes is numbered in hours. For each of them, a half-life designation is given—this indicates the period of time in which the isotope will lose 50 pct

of its effectiveness. In another similar period it will lose another 50 pct and so on until a totally different material remains.

In addition to the sale of isotopes, the AEC will pile-irradiate materials furnished by customers, under a service-irradiation program.

**As to power**, here again industry has a vital interest. When the time comes to build a power pile, the many components of such power units will be made by industrial firms. The government will be the customer until there is a power pile which can be operated or leased by industrial firms.

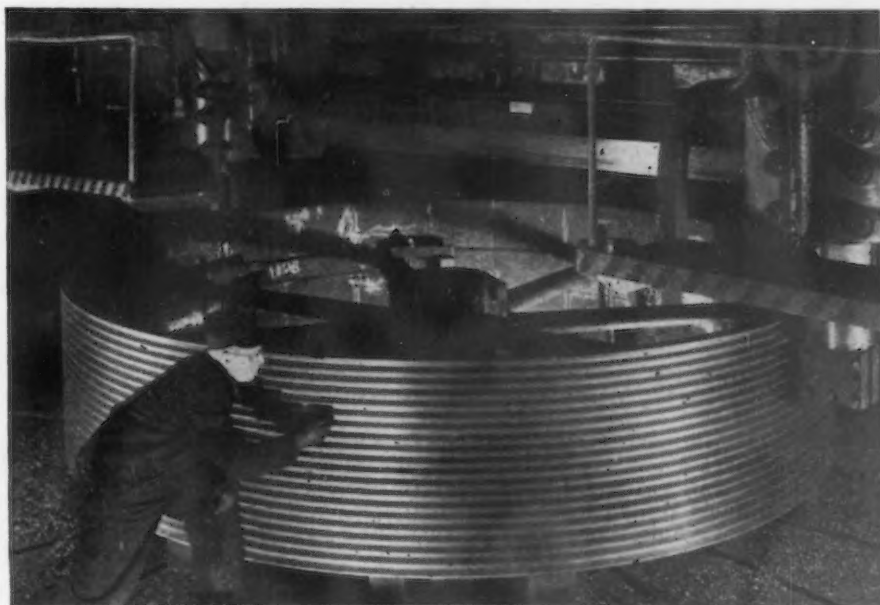
It is believed that within 5 years there will be a demonstration of usable electrical energy derived from nuclear reactors. Within a decade it may be possible to apply nuclear energy to certain specific highly critical problems of energy generation. But regardless of the time involved, be it 20 or 50 years, it is generally agreed that the process will be one of gradually supplementing rather than replacing the general power resources of the world. It is likely that the first commercial installations will be in regions where costs for alternative sources of energy are high or where there is inadequate access to coal and economical water power.

The Atomic Energy Commission assumed full responsibility for the development of atomic energy only 6 months ago and is charged with carrying out the following basic functions: (a) The production of fissionable materials for industrial, medical and military applications; and (b) research in physics, chemistry, biology, metallurgy, and other sciences and the development of the industrial, medical and military applications of atomic energy.

**While the over-riding aspect** of the production and research efforts is that of national defense, one of the most significant circumstances in relation to atomic energy is that the effort required, from the time the raw materials are mined and refined to the production of fissionable materials and even later steps, follows almost precisely the same path, whether the end product is to be atomic weapons or atomic materials to be used for peaceful purposes. In either case, the same immense industrial and research effort is required for 75 to 80 pct or more of the way.

A government monopoly in the truest sense, the Commission exercises control through ownership of materials, plants and laboratories, and operation of such facilities by private industrial or educational institutions under

**IN THE GROOVE:** Cast in two sections and then bolted together, the 169 in., 19-groove sheave, is one of the largest made recently by Allis-Chalmers Mfg. Co. The sheave will work with another 24-in. sheave on a generator drive off a steam engine. Transmitting 524 hp this sheave will turn at 85 rpm.



contract. Through the devices of more than 300 contracts the Commission operates facilities, carries on research and production in government-owned properties representing a capital investment of nearly \$2 billion. In addition to the 300 prime contractors there is a much larger number of sub-contractors. The employees of the Commission number about 5000, and contractors' employees working on atomic projects number about 40,000.

**Appropriations-wise** the Atomic Energy Commission is not likely to suffer. In fact an increase in the rate of expenditures is expected this year due to the broadened programs of research and development called for by the Atomic Energy Act and to increase construction outlays for projects at all research and production centers.

The Commission's main installations are at Oak Ridge, Tenn.; Hanford, Wash., and Los Alamos, N. Mex.

The plants at Oak Ridge are engaged in separating the fissionable isotope uranium 235 from natural uranium. The substance of the operation at Hanford is the production of plutonium. Los Alamos is the location of the Commission's activities in the military application of atomic energy. All three installations are operated by outside contractors.

The Commission's research operations are carried on in laboratories throughout the country, of which three are regional national laboratories. The Argonne National Laboratory is the successor to the Metallurgical Laboratory of the Manhattan District. Par-

ticipating in the program of technical management of the laboratory are 25 mid-western universities. Other academic and industrial institutions are utilizing the facilities of the laboratory. The present program of this laboratory includes pile research and construction, nuclear physics, metallurgy, chemistry, biology, instrumentation, and occupational health.

The second national laboratory being set up is the Brookhaven National Laboratory, Camp Upton, Long Island. It is similar in function to the Argonne Laboratory, and at present there are nine Eastern universities participating in the management. Plans for a third national laboratory on the West Coast are underway. Development will probably be started during the current fiscal year.

Other laboratories include:

**Clinton laboratories**—The Clinton laboratories at Oak Ridge are operated by Monsanto Chemical Co. The research program includes:

(1) Design, construction, and operation of an experimental nuclear energy plant for the production of power.

(2) Establishment of a training school on nuclear piles.

(3) Production and separation of radioisotopes for medical and biological research.

The power pile program at Oak Ridge will require many experiments before the final design can be settled. The pile's first operation is expected to provide heat energy for steam electric generation. Considerable emphasis will be laid, during design and construction of the plant, upon

achieving a heat source of long life and reliability.

**Knolls atomic power laboratory**—In accordance with a Manhattan engineer district contract with the General Electric Co., a nuclear research laboratory is being established at Schenectady, N. Y., for the study of all phases of power generation from atomic energy. Chemical, physical, metallurgical, and chemical engineering facilities are planned. A part of this research program has been established at Hanford.

**Radiation laboratory, University of California**—This laboratory is doing basic nuclear research, using the largest cyclotron in the United States and developing other important atom-splitting equipment. Research on transuranic elements will be continued.

## Allegheny-Ludlum Pays \$2 Million Back Wages

Pittsburgh

• • • In the largest single payday in its history, Allegheny Ludlum Steel Corp., recently paid more than \$2 million to over 18,000 present and former employees. The special payday was for the purpose of making payments as a result of inequalities in wage rates during the period from Jan. 4, 1944, through Mar. 31, 1947. This part of the settlement, which was agreed upon by the company and its workers, is in accordance with a directive issued by the former War Labor Board.

Five company plants participated in the payday. They were: Brackenridge, Pa., where approximately 9700 workers were paid about \$1,130,000; West Leechburg, Pa., where about 3100 workers got \$318,000; Dunkirk, N. Y., where approximately \$359,000 was paid to about 3000 workers; Watervliet, N. Y., where some 1400 workers got about \$165,000, and Buffalo, N. Y., where approximately \$67,000 was paid to about 1000 workers.

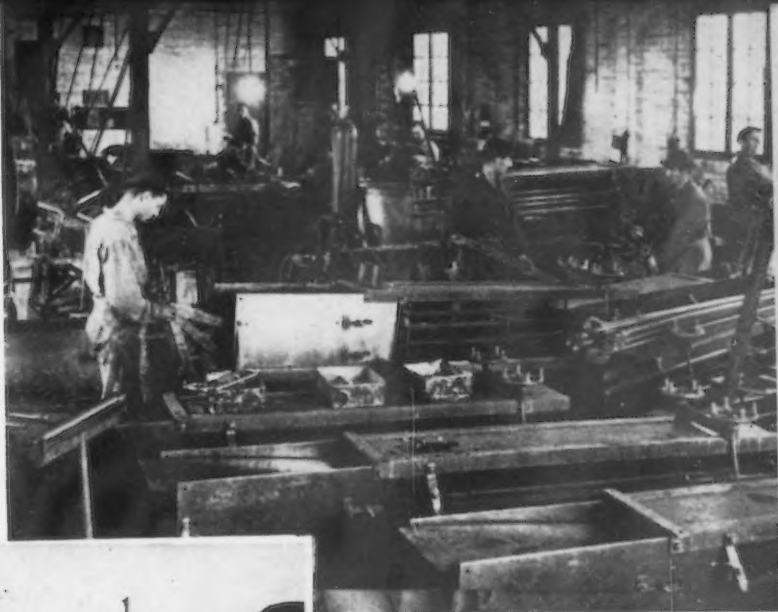
An additional payment, the total amount of which will equal 2¢ an hr during the affected period, will be paid later to employees whose wages during that period have been determined to have been below present wage scales. This payment will complete settlement of all company wage inequities.

## Coming Events

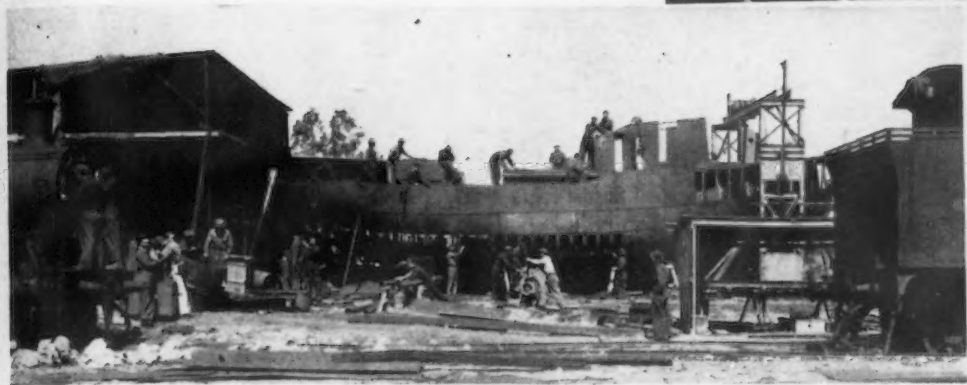
- July 14-18 American Society of Civil Engineers, Duluth, Minn.
- Aug. 25-29 National Assn. of Power Engineers, Inc., Boston.
- Sept. 8-12 Instrument Society of America, conference, Chicago.
- Sept. 10-12 Porcelain Enamel Institute, Inc., Columbus, Ohio.
- Sept. 17-26 National Machine Tool Builders' Assn., machine tool show, Chicago.
- Sept. 22-25 Assn. of Iron & Steel Engineers, annual meeting, Pittsburgh.
- Sept. 29-Oct. 3 American Gas Assn., San Francisco.
- Oct. 2-3 Gray Iron Founders' Society, annual convention, Milwaukee.
- Oct. 6-7 Packaging Machinery Manufacturers Institute, annual meeting, Springfield.
- Oct. 16-17 National Conference on Industrial Hydraulics (formerly Hydraulics Machinery Conference), annual meeting, Chicago.
- Oct. 18-24 National Metal Exposition, Chicago.
- Oct. 31 Illinois Mining Institute, annual meeting, Springfield, Ill.
- Oct. 30-Nov. 1 American Society of Tool Engineers, semi-annual meeting, Boston.



## Industry in Palestine Grows With Support of Both Jews and Arabs



**FARM INDUSTRY:**  
*Agricultural workers  
have banded together  
to set up their own ma-  
chine shops, as above.*



**PIONEER SHIPBUILDERS:** *Established in 1934, the Vulcan Foundries shipyard  
above has been building constantly since that time. The Economic Bureau of the  
Palestine Foundation Fund is holding an exhibition featuring the output of  
Palestinian industry and the need for American products in the New York Museum  
of Science and Industry.*

**HOUSING HARDWARE:** *S. Friedmann Ltd., of Jerusalem  
are producing stoves, furnaces, metal furniture, and builders'  
hardware for the building boom.*



**VULCAN FOUN-  
DRIES:** *Pioneer heavy  
industry in Palestine  
has doubled its sales  
volume during the past  
three years. It is pro-  
ducing a complete line  
of castings.*



**MACHINE WORK GROWS:** *Jobs  
of increasing complexity are being  
undertaken locally in Palestinian  
shops. Jews work side by side with  
Arabs in same unions.*



## Industrial Briefs . . .

• **NEW FABRICATION PLANT**—The \$167,000 light structural steel fabrication plant and office of Pittsburgh-Des Moines Steel Co., now under construction at Santa Clara, Calif., is expected to be in operation in October.

• **SETS SAFETY RECORD**—One of the best safety records in years was disclosed recently in a National Safety Council report that 12 plants of Carnegie-Illinois Steel Corp., U. S. Steel subsidiary, had operated without a single lost-time accident over a combined period of 25 million man-hr of working time. The National Safety Council president pointed out that the entire Carnegie-Illinois organization, with 100,000 employees, has an annual accident frequency rate well below the national average for the steel industry.

• **NEW APPOINTMENT**—Raoul A. Charpentier, president Storms Drop Forging Co., Springfield, Mass., has been made a director of the Drop Forging Assn.

• **TO BUILD FURNACES** — The construction of two electric furnaces at the East Works of American Rolling Mill Co., a \$3 million project, has begun. The two new furnaces will be of the latest design, with rated steel-making capacities of 70 tons each. Construction is expected to be completed early next year.

• **EXPANSION PROGRAM** — A 2-year modernization and expansion program, that will cost SKF Industries, Inc., more than \$4 million to equip its two Philadelphia plants with new machinery capable in some instances of operating from two to six times faster than standardized equipment long used in the antifriction bearing industry, has been announced.

• **NEW RESEARCH LAB.**—A new research laboratory and test plant is being erected by Hanson-Van Winkle-Munning Co. on their property at Matawan, N. J.

• **FORMS COMPANY**—Edward G. Cressell announces the establishment of the Cressell Stainless Steel Co., 333 N. Michigan Ave., Chicago, a sales service engineering company to handle stainless steel in all forms.

• **COMPANIES MERGE** — The merger of The Herbrand Corp., Fremont, Ohio, manufacturers of standard tools and special drop forged parts, into The Bingham Stamping Co., Toledo, manufacturers of brake lever assemblies for automobiles and trucks, has been made effective. Combined future operations will be conducted under the name of The Bingham Stamping Co.

• **QUALITY TESTING** — An independent agency for sampling, testing, certifying of materials and products to aid consumer, distributor and producer has been organized in New York as the American Standards Testing Bureau, Inc., 44 Trinity Place, New York.

• **PURCHASES PLANT** — The Charles L. Jarvis Co., Middletown, Conn., has acquired the Dowding Div. of the Henry L. Hanson Co., North Attleboro, Mass. This plant has devoted its facilities to engineering and finishing taps and dies distributed primarily in the New England area. Distribution will now be on a national basis directed from the Jarvis Co., Middletown, headquarters.

• **FOR SALE** — A \$3½ million Ashtabula, Ohio, war plant capable of producing 70,000 tons of calcium carbide annually from limestone and coke is offered for sale or lease by the WAA.

• **DISTRIBUTORS**—Hydraulic Machinery, Inc., Dearborn, has appointed Cunha International Corp., Detroit, as foreign distributors of the complete line of Hy-Mac special machinery, hydraulic power units, aviation test equipment and injection molding machines.

## British Market To Get Two-Fifths Of Automotive Output

London

••• The British automobile industry is to raise the quota of cars for export from one-half to three-fifths of the total output. The manufacturers of heavy vehicles have agreed to increase their quota from one-third to two-fifths. The government, striving to close the gap between imports and exports, originally asked for an increase in car exports to three-quarters of the output, but the manufacturers pointed out that this would lead to difficulties in the home market besides unbalancing the costing of the industry.

In comparison with 1938, when the British public were supplied with 22,500 new British cars a month, the number of cars available for the home market in future will be about 10,000, provided that output is kept up. The manufacturers are to follow up agreement to the increases in export quotas by drawing the attention of the government to the need for increased allocations of raw materials, particularly steel.

The industry has recently been told that its allocation of steel during the summer months will fall short of the demand by 30 pct. It is estimated that this cut, if adhered to, will cause a drop of one-quarter in production. The manufacturers are protesting against the imposition of double purchase tax on cars of a basic price of over \$4,000 in the belief that the loss of revenue that this increase is designed to make up is small. The Chancellor is to be asked to reconsider this part of the new tax proposals.

London

••• The trade agreement recently concluded by Belgium and Italy provides for commercial transactions between the two countries amounting to \$80,000,000. Among scheduled Belgian exports to Italy are manganese ore, semifinished and finished steel, nonferrous metals, and engineering products. Italy will send to Belgium zinc ore and other mineral products, agricultural machinery, and marine engines, in addition to fruit and textile products.



## Construction Steel . . .

### ••• Fabricated steel awards this week included the following:

- 2800 Tons, Bridge, Luzerne County, Pa., Pennsylvania Dept. of Highways, to Bethlehem Steel Co., Bethlehem. Reported as 2740 ton inquiry in June 12 issue.
- 1600 Tons, State of Michigan, Sault Ste. Marie bridge, to American Bridge Co., Pittsburgh.
- 1500 Tons, Montague, Mass., state bridge to Phoenix Bridge Co., Phoenixville, Pa. through J. F. Fitzgerald Construction Co., Boston, contractors.
- 1500 Tons, Chesterfield, Mass., state bridge to Bethlehem Steel Co., Bethlehem.
- 725 Tons, bridges on Route 44 near Camden, New Jersey Dept. of Highways, through F. A. Canuso & Sons, to Bethlehem Steel Co., Bethlehem.
- 700 Tons, Gloucester County, N. J., highway bridge, New Jersey Dept. of Highways, to Bethlehem Steel Co., Bethlehem.
- 700 Tons, Temple, Tex., beam span, Texas State Highway Dept. to Virginia Bridge Co., Roanoke, Va.
- 750 Tons, Fort Bragg, Calif., state highway bridge to Consolidated Steel Co., Los Angeles.
- 500 Tons, Philadelphia, bottling plant, Ortlieb Brewing Co., to Belmont Iron Works, Philadelphia.
- 300 Tons, Richmond, Ind., building for Perfect Circle Piston Ring Co. to Central States Bridge Co., Indianapolis.

### ••• Fabricated steel inquiries this week included the following:

- 2960 Tons, San Mateo Co., Calif., overcrossings on Bayshore Freeway between South San Francisco and Burlingame, California Div. of Highways, Sacramento, bids to July 30.
- 2500 Tons, Philadelphia, subway extension, G. H. Flinn Corp., New York, low bidding contractor.
- 1800 Tons, Bellview, Neb., power station for General Nebraska Public Power & Irrigation District. Bids on July 12.
- 500 Tons, Kankakee, Ill., building for General Mills. Bids on July 8.
- 362 Tons, Thermopolis, Wyo., construction Boysen Dam and relocation of Chicago, Burlington & Quincy R. R., Boysen Unit, Bureau of Reclamation, Denver, Spec. 1890, bids to Aug. 20.
- 310 Tons, Saugus, Calif., bridge over Santa Clara River and Southern Pacific R.R. tracks, California Div. of Highways, Los Angeles, bids to July 24.
- 300 Tons, Yarmouth, Me., state bridge.
- 300 Tons, Stroudsburg, Pa., hospital.
- 260 Tons, Philadelphia, press floor for Philadelphia Inquirer, McCloskey & Co., Philadelphia.
- 255 Tons, Douglas Co., Ore., Jackson Creek Road bridge, Umpqua National Forest, Public Roads Administration, Portland.
- 225 Tons, Union Grove, Ill., highway bridge. Bids July 11.
- 190 Tons, Plymouth Meeting, Pa., ore screening factory for E. J. Lavino.
- 185 Tons, Arnold, Ill., Whiteside County highway bridge. Bids July 11.
- 160 Tons, Durham, N. C., addition to Duke Univ. library, through architect.
- 161 Tons, Washington Co., Ore., separation structure, Sunset Highway, near Orenco, Birkemeier & Saremal, Portland, general contractor.

### ••• Reinforcing bar awards this week included the following:

- 530 Tons, Butler and Marshall Counties, Iowa, highway paving, Booth & Olson Inc., Sioux City, Iowa, previously reported low bidder, received contract. Erection by Des Moines Steel Co., Des Moines, Iowa.
- 200 Tons, Chicago, building addition rotogravure plant for R. R. Donnelly & Co. through Peter Hamlin Co., Chicago, to Bean Steel Co., Chicago.
- 190 Tons, Chicago, Powers building, Mc-

Carthy Bros., contractors, to J. T. Ryerson & Sons, Chicago.

- 113 Tons, Birmingham, foundation for Birmingham City Hall, to Virginia Steel Co., Richmond, Va., through J. F. Holley, contractor.

- 100 Tons, De Kalb, Ill., women's dormitory building, Federal Construction Co., contractor, to Ceco Steel Products Co., Chicago.

### ••• Reinforcing bar inquiries this week included the following:

- 1492 Tons, Thermopolis, Wyo., construction Boysen Dam and relocation of Chicago, Burlington & Quincy R. R., Boysen Unit, Bureau of Reclamation, Denver, Spec. 1890, bids to Aug. 20.
- 950 Tons, Omaha, Neb., sewer project. All bids rejected.
- 489 Tons, San Mateo County, Calif., overcrossings on Bayshore Freeway between South San Francisco and Burlingame, California Div. of Highways, Sacramento, bids to July 30.
- 200 Tons, Riverton, Wyo., Wyoming Canal structures, Bureau of Reclamation, Denver, Spec. 1883, bids to July 17.
- 105 Tons, Saugus, Calif., bridge over Santa Clara River and Southern Pacific R. R. tracks, California Div. of Highways, Los Angeles, bids to July 24.
- 100 Tons, Ashland, Wis., power house. La Crosse Dredging Corp., contractors.

## West Coast

(CONTINUED FROM PAGE 84)

they also operated the Lake Union Drydock Co. until 1943 when the partnership was dissolved. The company now is reported as laying out one of the area's most ambitious programs, although the present payroll is only 900 workers. One C-3 Maritime ship has been scrapped here and two smaller ones are scheduled for the same operation. All of the scrap goes to the Bethlehem-Pacific Coast Steel Corp. in Seattle. Steel fabrication is being done here and railroad car repair work is one of the more recent ventures.

**Lake Union Drydock Co., Seattle:** About 250 persons are employed here repairing yachts, tugs, fishing boats and Maritime Commission and Army ships.

**Lake Washington Shipyard, Seattle:** This yard is practically inoperative.

**Winslow Marine Railroad & Shipbuilding Co., Seattle:** Minor repair work is being carried out at present.

**N. C. Jansen Drilling & Mfg. Co., Seattle:** This small yard has just launched its eighth steel fishing boat which is of all welded construction and has a tubular frame.

## Los Angeles Area

Shipbuilding and repair in south-

### ••• Plate inquiries this week included the following:

50,000 Tons, Portland, Me., Montreal pipe line for oil company.

### ••• Railroad car awards this week included the following:

American Car & Foundry Co. has received the following orders for freight car equipment: Gulf, Mobile & Ohio R. R. Co., 300 50-ton welded box cars and 100 50-ton steel high side gondola cars; and Chicago & Eastern Illinois R. R. Co. 25 50-ton steel flat cars. The cars will be built at the ACF Madison, Ill. and St. Louis plants.

The Armour Line has ordered 1000 refrigerator cars from General American Transportation Co. and 1000 of the same type from American Car & Foundry Co. in Chicago.

The Milwaukee R. R. has ordered 1000 50-ton hopper cars from Pressed Steel Car Co., McKees Rocks, Pa.

The Great Northern R. R. will build 500 50-ton box cars in their own shops.

The Pennsylvania R. R. will build 1000 50-ft 6 in. box cars at their Altoona shops.

### ••• Railway inquiries this week included the following:

The Chicago Illinois Midland R. R. is inquiring for 100 to 350 triple hopper cars and 250 to 350 70-ton gondolas.

The Reading R. R. Co. is inquiring for 1000 50-ton box cars.

The Colorado & Wyoming R. R. is advertising for bids for 990 tons of rails, 125,000 tie plates, 350 kegs of track bolts and 2,750 angle bars. Bids are due at noon July 21.

ern California shows a drastic decline since October, 1945, continuing the downward movement from the peak reached in late 1943. Most of the work in this area now consists of repairs on merchant and naval vessels and some construction of small tugboats, fishing and pleasure boats. The conversion of small naval craft to commercial uses, which provided a considerable amount of work last year, is now largely completed. Total employment at the major Los Angeles yards is 1600, twice the 1939 average.

**Bethlehem Steel Co., Shipbuilding Div., San Pedro Yard, Terminal Island:** This yard has reverted to its prewar status of repair work, servicing merchant ships in Long Beach and Los Angeles Harbor and has a payroll of 700 workers. Wartime peak employment here was 8000.

**Todd Shipyards Corp., San Pedro:** Approximately 900 workers are employed here now on repair work only.

**California Shipbuilding Corp., Terminal Island:** This property has been dismantled as a shipyard and is now being operated by the National Metal & Steel Corp., headed by Morris Schapiro. Approximately 65 vessels, mostly destroyers, LCI and LSM craft, and one submarine are on hand ready for breaking.

# MACHINE TOOLS

... News and Market Activities

## Reports Order Volume in Machine Tools Industry Holding Up

• • • Order volume of some of the pivotal segments of the machine tool industry is holding up, and as is usually the case, builders are getting business as they raise their prices, according to reliable sources in the trade.

Most producers have a high number of quotations out, some of which are resulting in some long-term business, for delivery next year, as a part of long-range programs; part of the customers at least can find no advantage in waiting.

In Detroit, machine tool activity is picking up and several auto manufacturers have been sending out large volumes of inquiries for what is interpreted by most sources to be the industry's 1949 model run. Based on the nature of the present inquiries for new tooling, it has been widely concluded that any changes made in 1948 models will be confined to body changes.

It is the opinion of most machine tool sources in Detroit that extensive changes in power plants, spring suspensions and transmissions will not reach the public before introduction of the industry's 1949 models although these cars may and probably will be introduced during 1948.

Inquiries for new equipment for Buick seem to confirm the fact that at least part of the new Buick transmissions will be produced at Flint. It is also indicated that the new power plant for the Oldsmobile will not be available earlier than midsummer 1948.

Detroit Transmission Div. is reported to have issued a large number of requests for quotations in connection with the extensive expansion program being planned.

An interesting development in tooling observed in Detroit is that more and more of the machine tool companies are being asked to design from start to finish a tool that will be used to perform all the machinery operations required on a specific part. One result of the new broad requirements for automobile tools is that engineers of the machine tool builders are

### WAA to Increase Discounts Authorized on Surplus Machine Tools

• • •

spending a great deal more time in Detroit than they have heretofore.

In Cincinnati, War Assets Administration has announced the sale of 3300 machine tools from July 8 through 25, representing an acquisition cost of \$25 million. The tools including horizontal and vertical boring machines, single and multiple spindle drilling machines, horizontal milling machines, shapers, surface, tap, centerless and cutter grinders, turret and engine lathes, etc., cut-off machines and automatic screw machines will be sold at fixed price and Clayton formula prices. On or after July 11, the policy will be first come, first served.

Negotiations for government-built plants, operated by local companies, are underway for those plants used by Cincinnati Shaper Co., King Machine Tool Co. and American Tool Works.

Some sources in the Cincinnati area report that production is down and buying has slacked off even more. Holidays are a factor in production, but most observers believe that the usual summer slack period will continue until well after the machine tool show in the fall. Some builders in the Cincinnati area are not going to wait until the show to display their new models; models are to be released in many cases just as soon as they come off the line.

Manufacture of a new precision universal drill jig to be used on all types and makes of drill presses has been announced by Porter Machine Co., Cincinnati. At present, the company is engaged in making precision parts for machine tools, but according to Walter G. Porter, vice-president of the company, the firm will be divided into two divisions, one for manufacturing and one for contract work.

In Washington, an increase from 12½ to 17½ pct discount on surplus, general purpose machine tools has been granted by WAA to machine tool rebuilders, manufacturers, exporters, dealers or other distributors who purchase for resale. The increased discount, which applies to fixed price tools generally in long supply, was authorized in a summary of procedures and instructions distributed to all WAA zone and regional offices on the disposal of machine tools.

On short supply, easy-to-sell machine tools, no discount or commissions will be allowed during the first 10 days of a sale to commercial buyers. The discount plan, as worked out by WAA officials after consultation with dealers who have been large sellers for WAA, recognizes that dealers will have an important part in speeding up disposal of long-supply machine tools. The commissions of 12½ pct to WAA approved dealers for effecting sales of machine tools remains the same.

WAA regional directors have been authorized to determine the short supply items in their regions. Formerly this determination was made by a national list. Short-supply items must still be offered first to priority claimants.

Applications for donations of standard general purpose machine tools to agencies or institutions supported by federal, state or local governments and non-profit educational and charitable institutions will be received during an offering and will be acted upon 30 days after the sale to non-priority purchasers. Special machine tools are available at any time for the donation program after screening for the Joint Army-Navy Machine Tool Program.

Donations will be made on an f.o.b. shipping point basis, except that donees shall pay any direct costs which may be involved in packing or crating and loading in preparation for shipment. Discounts to schools remain unchanged.



# MARVEL SAWS

*Metal Cutting*

Better Machines—Better Blades

Regardless what type hack saw machines and metal-cutting band saw machines you use, MARVEL BLADES will improve performance. There are sound reasons why this is true; practical reasons that are easily understood and demonstrated.

MARVEL High-Speed-Edge Hack Saw Blades, with a genuine high-speed-steel cutting edge integrally welded to a tough alloy steel body, are both fast-cutting and positively unbreakable. This construction permits greatly increased speeds and feeds and faster blade tensioning. Still, they last much longer than ordinary blades.

MARVEL High-Speed-Edge Hole Saws, with this same unbreakable construction and heavy-duty arbors, have the extra strength required for drill press and lathe use . . . rapidly saw holes from  $\frac{3}{8}$ " to  $4\frac{1}{2}$ " diameter thru steel of up to  $1\frac{1}{8}$ " thickness.

MARVEL Band Saws are of selected quality. They come ready for use, pre-welded to size for each make and model saw. Individually boxed, they are protected against kinking, rusting or damage to teeth!

Write for Blade Catalog Sheet.



ARMSTRONG-BLUM MFG. CO.

5700 BLOOMINGDALE AVE. • CHICAGO 39, U. S. A.

# NONFERROUS METALS

... News and Market Activities

## Sets Tin Allocations

Washington

• • • Recommendation that the United States receive an interim allocation of 6750 long tons of tin metal for the second half of 1947 has been made by the Combined Tin Committee. France has been allotted the second largest amount, 1515 tons.

Since the quantity which will become available for allocation during the second half is expected to be greater than the 11,331 tons allocated at this time, further allotments will be made on or about Aug. 20.

Other interim allocations were: Italy, 657 tons; India, 525; Canada, 300; Sweden, 293; Poland, 239; Switzerland, 225; Czechoslovakia, 161; Denmark, 119; Australia, 103; Turkey, 90; Norway, 90; Egypt, 76; New Zealand, 42; Finland, 35; Chile, 29; Uruguay, 25; Austria, 22; Palestine, 16; Ceylon, 8; Ireland 7; and, the Philippines, 4 tons.

Some countries have already received by overpurchase the amounts to which they would have been entitled under the present allocation. Such nations may expect to receive allocations later in the year.

## Austrian Output Up

London

• • • Increases are reported in output of lead, zinc and molybdenum from mines and plants in the British zone of Austria. Monthly production estimates from the Bleiberg mine are: Lead concentrates, 490 long tons; zinc concentrates, 530 long tons; molybdenum concentrates, 4968 tons; fresh ores, lead and zinc, 4050 tons; lead-zinc ores (treatment), 9500 tons; molybdenum ores, 210 tons. For the

first time for three months enough coal has been available to produce refined lead and the monthly estimate for the Gailitz smelters is 680 tons.

## Beryllium Copper Up

New York

• • • The Beryllium Corp., Reading Pa., has announced a price increase on the beryllium content of its 3.75 to 4.25 pct beryllium copper alloy effective July 7. The new price is \$17.00 in place of the old \$14.75. The advance is due primarily to the higher cost of beryllium ores, which have gone up from \$11.00 per ton a few months ago to \$18.00.

## Lists Nonferrous Metals

### For Export From S. Korea

Washington

• • • Tungsten, lead, zinc, molybdenum, graphite, fluorite, and mica are included in the commodities which will be available for export from South Korea under a limited private trade program, effective July 15, sponsored by the State, War and Commerce Depts.

Entry of representatives of private firms seeking goods available for export will be permitted for the first time beginning July 15. In addition to permitting private export arrangements, applications will also be considered from firms desiring to make arrangements for future purchases of potential exports or to sell raw materials which Korea requires.

Selection of trade representatives to be admitted for the above purposes will be made on the basis of information submitted to the

Office of International Trade, Dept. of Commerce, through its field offices. Such information should include a detailed statement of the purpose of the visit, explaining whether it is to purchase goods, develop future markets or to furnish raw materials.

## Canadian Lead And Zinc Output Falls

Ottawa

• • • Canadian production of primary lead and zinc for the month of April fell below the total for the corresponding month of 1946, while output of copper and nickel moved upward.

Production of new copper amounted to 40,483,548 pounds in April, compared with 41,960,678 tons in March and 31,886,954 tons in April last year. For the four months ended April 30, 140,471,444 pounds of copper were produced, which compares with 123,950,427 pounds in the same period of 1946.

Production of nickel in April totalled 20,043,186 pounds compared with 20,028,671 pounds in the preceding month and with 18,479,626 pounds in April, 1946. For the first four months of this year cumulative production of nickel totalled 76,663,495 pounds as against 60,429,960 pounds in the same period a year ago.

Primary production of lead in April amounted to 25,850,461 pounds, compared with 28,850,117 pounds in the previous month and 30,864,007 pounds in April last year. During the first four months of this year output of lead totalled 105,124,657 pounds compared with 126,697,870 pounds in the 1946 period.

Primary zinc produced in all forms during April amounted to 36,341,332 pounds compared with 33,926,907 pounds in March and 41,594,847 pounds in April, 1946. In the four months ending with April, zinc output totalled 137,359,854 pounds, as compared with 166,070,405 pounds for the like period of 1946.

## Nonferrous Metals Prices

Cents per pound

	July 2	July 3	July 4	July 5	July 7	July 8
Copper, electro, Conn. ....	21.50	21.50	21.50	21.50	21.50	21.50
Copper, Lake, Conn. ....	21.625	21.625	21.625	21.625	21.625	21.625
Tin, Straits, New York ....	80.00	80.00	80.00	80.00	80.00	80.00
Zinc, East St. Louis ....	10.50	10.50	10.50	10.50	10.50	10.50
Lead, St. Louis ....	14.80	14.80	14.80	14.80	14.80	14.80



# NONFERROUS METALS PRICES

## Primary Metals

(Cents per lb, unless otherwise noted)

Aluminum, 99+%, f.o.b. shipping point (min. 10,000 lb)	15.00
Aluminum pig, f.o.b. shipping point	14.00
Antimony, American Laredo Tex.	33.00
Beryllium copper, 3.75-4.25% Be; dollars per lb contained Be	\$17.00
Beryllium aluminum, 5% Be; dollars per lb contained Be	\$27.50
Cadmium, del'd	\$1.75
Cobalt, 97-99% (per lb)	\$1.50 to \$1.57
Copper, electro, Conn. Valley	21.50
Copper, lake, Conn. Valley	21.25
Gold, U. S. Treas., dollars per oz.	\$35.00
Iridium, 99.8%, dollars per troy oz.	\$2.25
Iridium, dollars per troy oz.	\$85 to \$95
Lead, St. Louis	14.30
Lead, New York	15.00
Magnesium, 99.8+%	20.50
Magnesium, sticks, carlots	36.00
Mercury, dollars per 76-lb flask, f.o.b. New York	\$85.00 to \$87.00
Nickel, electro, f.o.b. New York	37.67
Palladium, dollars per troy oz.	\$24.00
Platinum, dollars per troy oz.	\$53 to \$56
Silver, New York, cents per oz.	64.75
Tin, Straits, New York	80.00
Zinc, East St. Louis	10.50
Zinc, New York	11.00
Zirconium copper, 6 pct Zr, per lb contained Zr	\$8.75

## Remelted Metals

### Brass Ingot

(Cents per lb, in carloads)

85-5-5-5 Ingot	
No. 115	18.00
No. 120	17.50
No. 123	17.00
80-10-10 Ingot	
No. 305	22.00
No. 315	20.00
88-10-2 Ingot	
No. 210	27.75
No. 215	26.25
No. 245	20.25
Yellow ingot	
No. 405	14.50
Manganese Bronze	
No. 421	16.50

### Aluminum Ingot

(Cents per lb, lots of 30,000 lb)

95-5 aluminum-silicon alloys:	
0.30 copper, max.	15.75
0.60 copper, max.	15.50
Piston alloys (No. 122 type)	13.75
No. 12 alum. (No. 2 grade)	13.25
108 alloy	13.50
195 alloy	14.25
AXS-679	13.75
Steel deoxidizing aluminum, notch-bar, granulated or shot	
Grade 1-95 pct-97½ pct	14.50
Grade 2-92 pct-95 pct	12.50
Grade 3-90 pct-92 pct	11.75
Grade 4-85 pct-90 pct	11.00

## Electroplating Supplies

### Anodes

(Cents per lb, f.o.b. shipping point in 500 lb lots)

Copper, frt. allowed	
Cast, oval, 15 in. or longer	37½
Electrodeposited	32½
Rolled, oval, straight, delivered	32½
Brass, 80-20, frt. allowed	
Cast, oval, 15 in. or longer	33½
Zinc, Cast, 99.99	18½
Nickel, 99 pct plus, frt. allowed	
Cast	51
Rolled, depolarized	52
Silver 999 fine	
Rolled, 1000 oz. lots, per troy oz.	67½

### Chemicals

(Cents per lb, f.o.b. shipping point)

Copper cyanide, 100 lb drum	43.00
Copper sulphate, 99.5, crystals, bbls	11.50
Nickel salts, single, 425 lb bbls, frt. allowed	14.50
Silver cyanide, 100 oz. lots, per oz.	54.00
Sodium cyanide, 50 pct, domestic, 200 lb drums	15.00
Zinc cyanide, 100 lb drums	34.00
Zinc sulphate, 89 pct, crystals, bbls, frt. allowed	7.75

## Mill Products

### Aluminum

(Cents per lb, base, subject to extras for quantity, gage, size, temper and finish)

Drawn tubing: 2 to 3 in. OD by 0.065 in. wall: 3S, 43.5¢; 52S-O, 67¢; 24S-T, 71¢; base, 30,000 lb.	
Plate: ¼ in. and heavier: 2S, 3S, 21.2¢; 52S, 24.2¢ 61S, 23.8¢; 24S, 24S-AL, 24.2¢; 75S, 75S-AL, 30.5¢; base, 30,000 lb.	
Flat Sheet: 0.136-in. thickness: 2S, 3S, 23.7¢; 52S, 27.2¢; 61S, 24.7¢; 24S-O, 24S-OAL, 26.7¢; 75S-O, 75S-OAL, 32.7¢; base, 30,000 lb.	
Extruded Solid Shapes: factor determined by dividing the perimeter of the shape by its weight per foot. For factor 1 through 4, 3S, 26¢; 14S, 32.5¢; 24S, 35¢; 53S, 61S, 28¢; 63S, 27¢; 75S, 45.5¢; base, 30,000 lb.	
Wire, Rod and Bar: screw machine stock, rounds, 17S-T, ¼ in., 29.5¢; ½ in., 37.5¢; 1 in., 26¢; 2 in., 24.5¢; hexagons, ¼ in., 35.5¢; ½ in., 30¢; 1 in., 2 in., 27¢; base, 5000 lb. Rod: 2S, 3S, 1¼ to 2½ in. diam, rolled, 23¢; cold-finished, 23.5¢ base, 30,000 lb. Round Wire: drawn, coiled, B & S gage 17-18; 2S, 3S, 33.5¢; 56S, 39.5¢; 10,000 lb base. B & S gage 00-1: 2S, 3S, 21¢; 56S, 30.5¢. B & S 16-16: 2S, 3S, 32.5¢; 56S, 38¢; base, 30,000 lb.	

### Magnesium

(Cents per lb, f.o.b. mill. Base quantity 30,000 lb.)

Sheet and Plate: Ma. FSA. ¼ in., 54¢-56¢; 0.188 in., 56¢-58¢; B & S gage 8, 58¢-60¢; 10, 59¢-61¢; 14, 69¢-74¢; 16, 79¢-81¢; 18, 87¢-89¢; 22, \$1.26-\$1.31; 24, \$1.71-\$1.75.	
Round Rod: M, diam, in., ¼ to ¾, 47¢; ½ to ¾, 45¢; 1¼ to 2½, 43.5¢; 3½ to 5, 42.5¢. Other alloys higher.	
Square, Hexagonal Bar: M, size across flats, in., ¼ to ¾, 52.5¢; ½ to ¾, 47.5¢; 1¼ to 2½, 45¢; 3½ to 5, 44¢. Other alloys higher.	
Solid Shapes, Rectangles: M, form factors, 1 to 4, 46¢; 11 to 13, 49¢; 20 to 22, 51.5¢; 29 to 31, 59.5¢ 38 to 40, 75.5¢ 47 to 49, 98¢. Other alloys higher.	
Round Tubing: M, wall thickness, outside diam, in., 0.049 to 0.057, ¼ to 5/16, \$1.21; 5/16 to ¾, \$1.12; ¾ to 7/16, 97¢; 0.058 to 0.064, 7/16 to ½, 89¢; ½ to ¾, 81¢; 0.065 to 0.082, ¾ to 1, 72¢ 0.083 to 0.108, 1 to 2, 68¢; 0.165 to 0.219, 2 to 3, 59¢; 3 to 4, 57¢. Other alloys higher.	

### Nickel and Monel

(Cents per lb, f.o.b. mill)

	Nickel	Monel
Sheets, cold-rolled	54	43
No. 35 sheets		41
Strip, cold-rolled	60	44
Rod		
Hot-rolled	50	39
Cold-drawn	55	44
Angles, hot-rolled	50	39
Plates	52	41
Seamless tubes	83	71
Shot and blocks		31

### Zinc

(Cents per lb, f.o.b. mill)

Sheet, l.c.l.	15.50
Ribbon, ton lots	14.50
Plates	
Small	12.50
Large, over 12 in.	14.50

### Copper, Brass, Bronze

(Cents per pound, f.o.b. mill effective June 11)

	Extruded Shapes	Rods	Sheets
Copper	33.53		33.68
Copper, hot-rolled		30.03	
Copper, drawn		31.03	
Low brass	34.04*	31.07	31.38
Yellow brass	32.39*	29.32	29.93
Red brass	34.65*	31.68	31.99
Naval brass	29.56	28.31	34.25
Leaded brass	27.98	24.39	30.13
Commercial			
bronze	35.52*	32.80	33.11
Manganese bronze	33.14	31.64	37.75
Phosphor bronze, 5 pct.	53.25*	52.25	52.00
Muntz metal	29.17	27.92	32.36
Everdur, Herculey, Olympic, etc.	37.07	35.57	38.44
Nickel silver, 5 pct.	41.20	40.28	38.67
Architectural			
bronze	27.94		
*Seamless tubing.			

## Scrap Metals

(Dealers' buying prices, f.o.b. New York in cents per pound.)

### Brass Mill Scrap

(Lots of less than 15,000 lb.)

Cartridge brass turnings	14½
Loose yellow brass trimmings	15½

### Copper and Brass

No. 1 heavy copper and wire	14½-15
No. 2 heavy copper and wire	13½-14
Light copper	12½-13
Auto radiators (unsweated)	8½-9
No. 1 composition	10½-11
No. 1 composition turnings	10-10½
Clean red car boxes	9-9½
Cocks and faucets	9-9½
Mixed heavy yellow brass	7-7½
Old rolled brass	7-7½
Brass pipe	8½-9
New soft brass clippings	10½-11
Brass rod ends	9½-10
No. 1 brass rod turnings	8½-9

### Aluminum

Alum. pistons free of struts	4-4½
Aluminum crankcases	5-5½
2S aluminum clippings	7-7½
Old sheet & utensils	5½-6
Mixed borings and turnings	2
Misc. cast aluminum	5-5½
Dural clips (24S)	5-5½

### Zinc

New zinc clippings	6-6½
Old zinc	4½-4¾
Zinc routings	1½-2
Old die cast scrap	2½-3

### Nickel and Monel

Pure nickel clippings	15½-17½
Clean nickel turnings	14-15
Nickel anodes	16-17
Nickel rod ends	17-18
New Monel clippings	10-10½
Clean Monel turnings	7-8
Old sheet Monel	9½-10
Old Monel castings	7½-8
Inconel clippings	8-8½
German silver clippings, mixed	7½-8
German silver turnings, mixed	5½-6

### Lead

Soft scrap lead	10-10½
Battery plates (dry)	5-5½

### Magnesium Alloys

Segregated solids	8
Castings	5

### Miscellaneous

Block tin	63-65
No. 1 pewter	50-52
No. 1 auto babblit	38-40
Mixed common babblit	11½-12
Solder joints	12-13
Siphon tops	38-39
Small foundry type	13-13½
Monotype	12-12½
Lino and stereotype	11½-12
Electrotype	10-10½
New type shell cuttings	10½-11
Clean hand picked type shells	4½-5
Lino and stereo dross	5-5½
Electro dross	3-3½

### Lead Products

(Cents per lb)

F.o.b. shipping point freight collect. Freight equalized with nearest free delivery point.	
Full lead sheets	18.26
Cut lead sheets	18.75
Lead pipe, manufacturing point	17.50
Lead traps and bends	List +42%
Combination lead and iron bends and ferrules, also combination lead and iron ferrules	List +42%
Lead wool	19.50

# SCRAP

... News and Market Activities

## Prices Hold but Strong Undertone Is Seen

### New York

... The market opened this week with no major price changes on sales to consumers. But brokers in many districts were paying well over the going delivered quotations to cover on old orders. Early in the week no new business had been placed to establish new prices but the trade felt prices would be definitely higher before the week was out.

Back of this feeling was the fact that many brokers were taking losses of \$2 to \$3 to cover on old business, according to reports from Pittsburgh, Chicago and Cleveland. In that latter area one broker was reported going to \$37.50 to fill a \$31.50 order.

Some steel scrap purchasing agents said the question was not which way prices would go but how far up they would move. It appeared to some observers that once the coal problem was settled a fairly heavy wave of buying would set in. Adding weight to this prediction they said that several large buyers who have been out of the market recently were expected to be seeking substantial tonnages very soon.

Despite the bullishness felt by dealers and a feeling even in some buying circles that higher prices may have to be paid, some of the more sober trade observers doubt that higher prices would substantially improve shipments. They say that prices are high enough now to bring out material and that speculative holding for, say \$2 a ton more, is not substantial.

**PITTSBURGH**—The holiday weekend loosened the taut rein that scrap interests had on the market, and most of them were awaiting developments to set a pattern early in the week. No sales of heavy melting grades were traceable, but sales of turnings at quoted prices were made. Despite the inactivity of the market from a selling standpoint, there is considerable bullishness. Many brokers are covering old, low priced orders at higher prices. Brokers who are short seem to be the main cause of present market bullishness, and the majority of brokers don't have scrap to sell. Some brokers are paying over \$36 a ton to cover \$32.50 and \$33 orders. There is very little scrap coming into the area

from out of the district, despite trade reports of average delivered prices for out-of-district scrap of \$37.50 a ton and over. Sales of short turning at \$32.50 a ton have been made and sales of machine shop turnings at \$30.75 have been made. Railroad scrap advanced in price on sale of one lot.

**CHICAGO**—Buyers intent on resisting any further price advance withheld placing new orders during the past week. All indications point to continued firm market conditions with most sellers hesitant about accepting new orders. Many old contracts remain unfilled and dealers and brokers report they are having difficulty meeting present commitments. Railroad specialties continued to advance with a few larger foundries refusing to go along at the higher price level. Higher prices in the immediate future are predicted by most qualified observers.

**PHILADELPHIA**—The market retained its strength here this week although mills were remaining out of the market. There was a general dullness perhaps attributable to the after holiday period. The softness reported in some quarters last week has not developed, with the recent quotations remaining firm.

**NEW YORK**—The market opened this week with brokers quietly covering old orders at no increase in price. No new business was being done but in many suppliers' minds there was a feeling new orders would be at higher prices. This may have been wishful thinking but it was having a slowing effect on shipments.

**DETROIT**—The market is strong again this week. Large mill buyers here are paying \$33.50 and \$34.50 on open orders, the differential of \$1 being designed to keep scrap at home that might otherwise be shipped to outlying steel centers. The new orders placed after the previous quotations were reported tend to confirm the sharp price jump indicated a week earlier when limited tonnages were reported as purchased at the prices indicated against orders from out of town buyers. Prices of machine shop and short shoveling turnings and cast iron borings advanced this week. Present purchases of scrap by large mill buyers are against open orders covering a 2-week period. There are strong indications that a further advance in scrap prices here is expected.

**CLEVELAND**—There has been little change in scrap prices here or in the valley as far as consumers are concerned but brokers are paying \$37.50, more than quoted prices, to cover on \$35 and in some cases \$31.50 orders. Sale of railroad heavy melting last week for \$39 has lent sympathetic strength to a market that

hardly required any. Demand is very strong and supply weak and some sources in the trade believe that the new buying will be at substantially higher prices.

**BOSTON**—Because of the coal wage uncertainty, closing of consumer plants for vacation and scrap trade vacations, shipments the past week dropped almost to the vanishing point. Yards and brokers appear uncertain regarding scrap values and are sitting on the sidelines until the situation clears.

**BUFFALO**—The price gap between dealers and consumers was widened during the past week. Supplies were tighter and the brokers were reported paying \$34 to \$34.50 to cover orders for scrap east of Rochester but the large melters stood pat on bids of \$32 for local material. It was believed, however, that settlement of the coal dispute would bring the mills into the market at higher prices. Foundry grade demand was easier.

**CINCINNATI**—Despite few sales on record due to the holiday and coal uncertainty, some consumers have reported buying No. 1 steel at \$33, up \$1 over last week's prices. Sentiment in the trade here leaned to the opinion that prices might turn higher when buying was resumed in volume.

**ST. LOUIS**—The continued scarcity and demand for some specialties shoved their prices up another \$1 this week. Prices of heavy melting grades are unchanged with dealers short on recent sales to mills. Shipments have been held up because of floods which have put fabricating yards here and other points along the rivers temporarily out of commission. Railroad lists: St. Louis Southwestern, 16 cars; Missouri-Kansas-Texas, 12 carloads; Missouri Pacific (supplemental), 10 cars; Gulf Coast Lines, 800 tons; Texas & Pacific, 800 tons; Chicago, Burlington & Quincy, 2000 tons.

**TORONTO**—General listlessness developed in the Canadian scrap iron and steel markets for the past week or ten days. The holiday season, now in full swing, is partly responsible for the unsettlement, but dealers state that there is not sufficient scrap appearing on the market to develop any interest. Most dealers are depending on day to day receipts to keep yard crews busy and take care of customers and in most instances yard workers have been sharply reduced. Consumers have given up hope of obtaining enough scrap in the domestic market for their requirements and while the mills have contracted for large tonnages of war scrap from Europe, the foundries have turned to pig iron to replace scrap in melting operations. Both dealers and consumers are of the opinion that it will take a lift in prices to bring out dormant scrap supplies. Scrap importations from the United States are confined to small tonnages due to the wide price differential.



# IRON AND STEEL SCRAP PRICES

## PITTSBURGH

Per gross ton delivered to consumer:

No. 1 hvy. melting	\$35.50 to \$36.00
RR. hvy. melting	39.00 to 39.50
No. 2 hvy. melting	35.50 to 36.00
RR. scrap rails	40.00 to 41.00
Rails 2 ft. and under	44.25 to 45.00
No. 1 comp'd bundles	35.50 to 36.00
Hand bld. new shts.	35.50 to 36.00
Hvy. axle turn.	35.00 to 35.50
Hvy. steel forge turn.	35.00 to 35.50
Mach. shop turn.	30.00 to 30.75
Shoveling turn.	31.50 to 32.00
Mixed bor. and turn.	30.00 to 30.50
Cast iron borings	31.00 to 31.50
No. 1 cupola cast	36.00 to 37.00
Hvy. breakable cast	37.00 to 37.50
Malleable	50.00 to 51.00
RR. knuck and coup.	44.00 to 45.00
RR. coil springs	44.00 to 45.00
RR. leaf springs	44.00 to 45.00
Rolled steel wheels	44.00 to 45.00
Low phos.	40.50 to 41.50

## CHICAGO

Per gross ton delivered to consumer:

No. 1 hvy. melting	\$33.50 to \$34.00
No. 2 hvy. melting	32.50 to 33.00
No. 1 bundles	33.50 to 34.00
No. 2 dealers' bundles	32.50 to 33.00
Bundled mach. shop turn.	32.50 to 33.00
Galv. bundles	30.50 to 31.00
Mach. shop turn.	29.00 to 30.00
Short shov. turn.	31.00 to 32.00
Cast iron borings	30.00 to 31.00
Mix. borings & turn.	28.50 to 29.00
Low phos. hvy. forge	38.50 to 39.50
Low phos. plates	36.00 to 37.00
No. 1 RR. hvy. melt.	35.00 to 37.00
Rerolling rails	42.00 to 43.50
Miscellaneous rails	40.50 to 41.50
Angles & Splice bars	41.75 to 42.25
Locomotive tires, cut	41.50 to 42.50
Cut bolster & side frames	39.50 to 40.00
Standard stl. car axles	43.50 to 44.00
No. 3 steel wheels	41.00 to 41.50
Couplers & knuckles	42.00 to 43.00
Malleable	56.00 to 58.00
No. 1 mach. cast.	45.00 to 46.00
Rails 2 ft. and under	44.50 to 45.50
No. 1 agricul. cast.	40.50 to 41.00
Hvy. breakable cast.	35.00 to 35.50
RR. grate bars	38.50 to 39.00
Cast iron brake shoes	40.00 to 40.50
Cast iron carwheels	42.00 to 43.00

## CINCINNATI

Per gross ton delivered to consumer:

No. 1 hvy. melting	\$32.00 to \$33.00
No. 2 hvy. melting	32.00 to 33.00
No. 1 bundles	32.00 to 33.00
No. 2 bundles	32.00 to 33.00
Mach. shop turn.	26.00 to 27.00
Shoveling turn.	28.00 to 29.00
Cast iron borings	27.00 to 28.00
Mixed bor. & turn.	26.00 to 27.00
Low phos. plate	41.00 to 42.00
No. 1 cupola cast.	46.00 to 47.00
Hvy. breakable cast.	37.00 to 38.00
Scrap rails	40.00 to 41.00

## BOSTON

Dealers' buying prices per gross ton, f.o.b. cars:

No. 1 hvy. melting	\$31.00 to \$32.00
No. 2 hvy. melting	31.00 to 32.00
Nos. 1 and 2 bundles	31.00 to 32.00
Busheling	31.00 to 32.00
Shoveling turn.	26.00 to 27.00
Machine shop turn.	24.00 to 25.00
Mixed bor. & turn.	23.00 to 24.00
Cl'n cast. chem. bor.	25.00 to 26.00
No. 1 machinery cast	40.00 to 45.00
No. 2 machinery cast	40.00 to 45.00
Heavy breakable cast.	40.00 to 45.00
Stove plate	40.00 to 45.00

## DETROIT

Per gross ton, brokers' buying prices, f.o.b. cars:

No. 1 hvy. melting	\$33.00 to \$33.50
No. 2 hvy. melting	33.00 to 33.50
No. 1 bundles	33.00 to 33.50
New busheling	33.00 to 33.50
Flashings	33.00 to 33.50
Mach. shop turn.	24.25 to 25.25
Shoveling turn.	25.75 to 26.25
Cast iron borings	25.75 to 26.25
Mixed bor. & turn.	25.50 to 26.00
Low phos. plate	34.25 to 35.25
No. 1 cupola cast.	39.00 to 40.00
Hvy. breakable cast.	29.00 to 31.00
Stove plate	32.00 to 34.00
Automotive cast.	38.00 to 40.00

Going prices as obtained in the trade by THE IRON AGE, based on representative tonnages.

## PHILADELPHIA

Per gross ton delivered to consumer:

No. 1 hvy. melting	\$37.00 to \$37.50
No. 2 hvy. melting	36.50 to 37.00
No. 1 bundles	37.00 to 37.50
No. 2 bundles	36.50 to 37.00
Mach. shop turn.	28.00 to 29.00
Shoveling turn.	28.00 to 29.00
Mixed bor. & turn.	26.00 to 27.00
Clean cast chemical bor.	31.00 to 33.00
No. 1 cupola cast.	46.00 to 47.00
Hvy. breakable cast.	44.00 to 45.00
Cast. charging box	44.00 to 45.00
Clean auto cast.	46.00 to 47.00
Hvy. axle forge turn.	36.00 to 36.50
Low phos. plate	40.50 to 41.00
Low phos. punchings	40.50 to 41.00
Low phos. bundles	39.50 to 40.00
RR. steel wheels	41.00 to 42.00
RR. coil springs	41.00 to 42.00
RR. malleable	52.00 to 53.00

## ST. LOUIS

Per gross ton delivered to consumer:

No. 1 hvy. melting	\$32.00 to \$33.00
No. 2 hvy. melting	30.00 to 31.00
Bundled sheets	30.00 to 31.00
Mach. shop turn.	23.00 to 23.50
Locomotive tires, uncut.	35.00 to 36.00
Mis. std. sec. rails	37.00 to 38.00
Rerolling rails	40.00 to 41.00
Steel angle bars	37.00 to 38.00
Rails 3 ft. and under	38.00 to 39.00
RR. steel springs	39.00 to 40.00
Steel car axles	39.00 to 40.00
Stove plate	36.00 to 37.00
Grate bars	36.00 to 37.00
Brake shoes	35.00 to 36.00
Malleable	54.00 to 55.00
Cast iron car wheels	40.00 to 41.00
No. 1 machinery cast.	40.00 to 41.00
Hvy. breakable cast.	35.00 to 36.00

## BIRMINGHAM

Per gross ton delivered to consumer:

No. 1 hvy. melting	\$30.50 to \$31.00
No. 2 hvy. melting	30.50 to 31.00
No. 2 bundles	30.50 to 31.00
No. 1 busheling	30.50 to 31.00
Long turnings	22.00
Shoveling turnings	24.00
Cast iron borings	23.00
Bar crops and plate	31.00 to 32.00
Structural and plate	31.00 to 32.00
No. 1 cast	38.00 to 39.00
Stove plate	34.00 to 35.00
No. 1 RR. hvy. melt.	31.50 to 32.00
Steel axles	31.50 to 32.00
Scrap rails	31.50 to 32.00
Rerolling rails	35.00 to 36.00
Angles & splice bars	33.00 to 34.00
Rails 3 ft. & under	33.00 to 34.00
Cast iron carwheels	32.00 to 34.00

## YOUNGSTOWN

Per gross ton delivered to consumer:

No. 1 hvy. melting	\$34.50 to \$35.00
No. 2 hvy. melting	34.50 to 35.00
Mach. shop turn.	28.50 to 29.00
Short shov. turn.	29.50 to 30.00
Cast iron borings	29.50 to 30.00
Low phos.	38.50 to 39.00

## NEW YORK

Brokers' buying prices per gross ton, on cars:

No. 1 hvy. melting	\$32.00
No. 2 hvy. melting	32.00
No. 2 bundles	32.00
Comp. galv. bundles	32.00
Mach. shop turn.	23.00 to 24.00
Mixed bor. & turn.	23.00 to 24.00
Shoveling turn.	24.50 to 25.00
No. 1 cupola cast	39.00 to 40.00
Hvy. breakable cast.	37.00 to 38.00
Charging box cast.	37.50 to 38.50
Stove plate	37.50 to 38.50
Clean auto cast.	39.00 to 40.00
Unstrip. motor blks.	35.00 to 36.00
Cl'n chem. cast bor.	25.00 to 25.50

## BUFFALO

Per gross ton delivered to consumer:

No. 1 hvy. melting	\$31.00 to \$32.00
No. 2 hvy. melting	31.00 to 32.00
No. 1 bundles	31.00 to 32.00
No. 2 bundles	31.00 to 32.00
No. 1 busheling	31.00 to 32.00
Mach. shop turn.	22.00 to 23.00
Shoveling turn.	24.00 to 25.00
Cast iron borings	22.00 to 23.00
Mixed bor. & turn.	22.00 to 23.00
No. 1 cupola cast.	35.00 to 38.00
Charging box cast.	29.00 to 30.00
Stove plate	30.00 to 35.00
Clean auto cast.	35.00 to 38.00
Malleable	37.00 to 39.00
Low phos. plate	34.00 to 36.00
Scrap rails	33.00 to 36.00
Rails 3 ft & under	38.00 to 40.00
RR. steel wheels	38.00 to 40.00
Cast iron carwheels	38.00 to 40.00
RR. coil & leaf spgs.	38.00 to 40.00
RR. knuckles & coup.	38.00 to 40.00

## CLEVELAND

Per gross ton delivered to consumer:

No. 1 hvy. melting	\$33.50 to \$34.00
No. 2 hvy. melting	33.50 to 34.00
Compressed sheet stl.	33.50 to 34.00
Drop forge flashings	33.50 to 34.00
No. 2 bundles	33.50 to 34.00
Mach. shop turn.	28.50 to 29.00
Shoveling turn.	29.50 to 30.00
No. 1 busheling	33.50 to 34.00
Steel axle turn.	33.50 to 34.00
Cast iron borings	29.50 to 30.00
Mixed bor. & turn.	27.00 to 27.50
Low phos.	36.50 to 37.00
No. 1 machinery cast.	43.00 to 45.00
Malleable	54.00 to 55.00
RR. cast.	43.00 to 45.00
Railroad grate bars	38.00 to 39.00
Stove plate	39.00 to 40.00
RR. hvy. melting	38.00 to 39.00
Rails 3 ft. & under	44.00 to 45.00
Rails 18 in. & under	45.00 to 46.00

## SAN FRANCISCO

Per gross ton delivered to consumer:

No. 1 hvy. melting	\$19.50
No. 2 hvy. melting	19.50
No. 2 bales	19.50
No. 3 bales	16.00
Mach. shop turn.	13.00
Elec. furn. 1 ft. und.	25.00
No. 1 cupola cast.	\$32.00 to 33.00
RR. hvy. melting	20.50

## LOS ANGELES

Per gross ton delivered to consumer:

No. 1 hvy. melting	\$19.50
No. 2 hvy. melting	19.50
No. 1 bales	19.50
No. 2 bales	19.50
No. 3 bales	16.00
Mach. shop turn.	14.50
No. 1 cupola cast.	\$35.00 to 36.00
RR. hvy. melting	20.50

## SEATTLE

Per gross ton delivered to consumer:

No. 1 & No. 2 hvy. melt.	\$20.00
Elec. furn. 1 ft. und.	\$23.50 to 25.00
No. 1 cupola cast.	27.50 to 29.00
RR. hvy. melting	21.00

## HAMILTON, ONT.

Per gross ton delivered to consumer:

Cast grades f.o.b. shipping point	
Heavy melting	\$17.50*
No. 1 bundles	17.50*
No. 2 bundles	17.00*
Mixed steel scrap	15.50*
Rails, remelting	18.50*
Rails, rerolling	21.50*
Bushelings	13.00*
Mixed borings & turnings	12.50*
Electric furnace bundles	20.50*
Manganese steel scrap	20.00*
No. 1 cast	19.00*
Stove plate	17.50*
Car wheels, cast	19.50*
Malleable iron	16.00*

\* Ceiling price.

## Comparison of Prices . .

Advances over past week in **Heavy Type**, declines in *Italics*. Prices are f.o.b. major basing points. The various basing points for finished and semifinished steel are listed in the detailed price tables.

Flat-Rolled Steel:	July 8, 1947	July 1, 1947	June 10, 1947	July 9, 1946
(cents per pound)				
Hot-rolled sheets .....	2.50	2.50	2.50	2.425
Cold-rolled sheets .....	3.20	3.20	3.20	3.275
Galvanized sheets (10 ga.)	3.55	3.55	3.55	4.05*
Hot-rolled strip .....	2.50	2.50	2.50	2.35
Cold-rolled strip .....	3.20	3.20	3.20	3.05
Plates .....	2.65	2.65	2.65	2.50
Plates, wrought iron.....	5.95	5.95	5.95	4.112
Stain's c-r strip (No. 302)	30.30	30.30	30.30	30.30

### Tin and Terneplate:

Tinplate, standard cokes.	\$5.75	\$5.75	\$5.75	\$5.00
Tinplate, electro (0.50 lb)	5.05	5.05	5.05	4.50
Special coated mfg. ternes	4.90	4.90	4.90	4.30

### Bars and Shapes:

(cents per pound)				
Merchant bars .....	2.60	2.60	2.60	2.50
Cold-finished bars .....	3.20	3.20	3.20	3.10
Alloy bars .....	3.05	3.05	3.05	2.92
Structural shapes .....	2.50	2.50	2.50	2.35
Stainless bars (No. 302) ..	26.00	26.00	26.00	25.97
Wrought iron bars .....	6.15	6.15	6.15	4.76

### Wire and Wire Products:

	(cents per pound)				
Bright wire .....	3.30	3.30	3.30	3.05	
Wire nails .....	3.75	3.75	3.75	3.75	

**Rails:**

(dollars per 100 lb)				
Heavy rails .....	\$2.50	\$2.50	\$2.50	\$43.39*
Light rails .....	2.85	2.85	2.85	49.18*

### Semifinished Steel:

(dollars per gross ton)				
Rerolling billets .....	\$42.00	\$42.00	\$42.00	\$39.00
Sheet bars .....	50.00	50.00	50.00	38.00
Slabs, rerolling .....	42.00	42.00	42.00	39.00
Forging billets .....	50.00	50.00	50.00	47.00
Alloy blooms, billets, slabs	61.00	61.00	61.00	58.43

### Wire Rods and Skelp:

	(cents per pound)				
Wire rods .....	2.55	2.55	2.55	2.30	
Skelp .....	2.35	2.35	2.35	2.05	

<b>Fig Iron:</b>	<b>July 8, 1947</b>	<b>July 1, 1947</b>	<b>June 10, 1947</b>	<b>July 9, 1946</b>
(per gross ton)				
No. 2, foundry, Phila....	\$36.51	\$36.51	\$36.51	\$28.34
No. 2, Valley furnace....	33.50	33.50	33.50	26.50
No. 2, Southern, Cin'ti....	34.75	34.75	34.75	28.94
No. 2, Birmingham .....	29.88	29.88	29.88	24.88
No. 2, foundry, Chicago†	33.00	33.00	33.00	26.50
Basic, del'd eastern Pa....	36.92	36.92	36.92	27.84
Basic, Valley furnace....	33.00	33.00	33.00	26.00
Malleable, Chicago† ....	33.50	33.50	33.50	26.50
Malleable, Valley .....	33.50	33.50	33.50	26.50
Charcoal, Chicago .....	45.99	45.99	45.99	42.34
Ferromanganeset .....	135.00	135.00	135.00	135.00

† The switching charge for delivery to foundries in the Chicago district is \$1 per ton.  
‡ For carlots at seaboard.

**Scrap:**

(per gross ton)				
Heavy melt'g steel, P'gh.	\$35.75	\$35.75	\$32.75	\$20.00
Heavy melt'g steel, Phila.	37.25	37.25	32.00	18.75
Heavy melt'g steel, Ch'go	33.75	33.75	31.25	18.75
No. 1, hy. comp. sheet, Det.	33.25	33.25	29.75	17.32
Low phos., Youngs'n....	38.75	38.75	35.75	22.50
No. 1, cast, Pittsburgh..	36.50	36.50	36.50	20.00
No. 1, cast, Philadelphia.	46.50	46.50	43.50	20.00
No. 1, cast. Chicago.....	45.50	44.00	41.50	20.00

**Coke, Connellsville:**

(per net ton at oven)				
Furnace coke, prompt...	\$10.50	\$10.50	\$10.50	\$8.75
Foundry coke, prompt...	11.25	11.25	11.25	9.85

### Nonferrous Metals:

(cents per pound to large buyers)				
Copper, electro., Conn....	21.50	21.50	21.50	14.375
Copper, Lake, Conn.....	21.625	21.625	21.625	14.375
Tin, Straits, New York...	80.00	80.00	80.00	52.00
Zinc, East St. Louis.....	10.50	10.50	10.50	9.50
Lead, St. Louis.....	14.80	14.80	14.80	9.50
Aluminum, virgin .....	15.00	15.00	15.00	15.00
Nickel, electrolytic .....	37.67	37.67	37.67	35.00
Magnesium, ingot .....	20.50	20.50	20.50	20.50
Antimony, Laredo, Tex..	33.00	33.00	33.00	14.50

Starting with the issue of Apr. 22, 1943, the weighted finished-steel index was revised for the years 1941, 1942 and 1943. See explanation of the change on p. 98 of the Apr. 22, 1943 issue. The index revised to a quarterly basis as of Nov. 16, 1944; for details see p. 98 of that issue. The finished steel composite price for the current quarter is an estimate based on finished steel shipments for the previous quarter. This figure will be revised when the actual data of shipments for this quarter are compiled.

## Composite Prices . .

## FINISHED STEEL

July 8, 1947.....	2.85664¢	per lb.....
One week ago.....	2.85664¢	per lb.....
One month ago.....	2.85664¢	per lb.....
One year ago.....	2.73011¢	per lb.....

## HIGH

1947....	2.85664¢		2.85664¢	
1946....	2.83599¢	Dec. 31	2.54490¢	Jan. 1
1945....	2.44104¢	Oct. 2	2.38444¢	Jan. 2
1944....	2.30837¢	Sept. 5	2.21189¢	Oct. 5
1943....	2.29176¢		2.29176¢	
1942....	2.28249¢		2.28249¢	
1941....	2.43078¢		2.43078¢	
1940....	2.30467¢	Jan. 2	2.24107¢	Apr. 16
1939....	2.35367¢	Jan. 3	2.26689¢	May 16
1938....	2.58414¢	Jan. 4	2.27207¢	Oct. 18
1937....	2.58414¢	Mar. 9	2.32263¢	Jan. 4
1936....	2.32263¢	Dec. 28	2.05200¢	Mar. 10
1935....	2.07642¢	Oct. 1	2.06492¢	Jan. 8
1934....	2.15367¢	Apr. 24	1.95757¢	Jan. 2
1933....	1.95578¢	Oct. 3	1.75836¢	May 2
1932....	1.89196¢	July 5	1.83901¢	Mar. 1
1931....	1.99626¢	Jan. 13	1.86586¢	Dec. 29
1930....	2.25488¢	Jan. 7	1.97319¢	Dec. 9
1929....	2.31773¢	May 28	2.26498¢	Oct. 29

**LOW**

2.85664¢		2.85664¢	
2.83599¢	Dec. 31	2.54490¢	Jan. 1
2.44104¢	Oct. 2	2.38444¢	Jan. 2
2.30837¢	Sept. 5	2.21189¢	Oct. 5
2.29176¢		2.29176¢	
2.28249¢		2.28249¢	
2.43078¢		2.43078¢	
2.30467¢	Jan. 2	2.24107¢	Apr. 16
2.35367¢	Jan. 3	2.26689¢	May 16
2.58414¢	Jan. 4	2.27207¢	Oct. 18
2.58414¢	Mar. 9	2.32263¢	Jan. 4
2.32263¢	Dec. 28	2.05200¢	Mar. 10
2.07642¢	Oct. 1	2.06492¢	Jan. 8
2.15367¢	Apr. 24	1.95757¢	Jan. 2
1.95578¢	Oct. 3	1.75836¢	May 2
1.89196¢	July 5	1.83901¢	Mar. 1
1.99626¢	Jan. 13	1.86586¢	Dec. 29
2.25488¢	Jan. 7	1.97319¢	Dec. 9
2.31773¢	May 28	2.26498¢	Oct. 29

## PIG IRON

.....\$33.15 per gross ton.....  
 .....\$33.15 per gross ton.....  
 .....\$33.15 per gross ton.....  
 .....\$26.45 per gross ton.....

## HIGH

\$33.15	Mar. 11	\$30.14	Jan. 7
30.14	Dec. 10	25.37	Jan. 1
25.37	Oct. 23	23.61	Jan. 2
\$23.61		\$23.61	
23.61		23.61	
23.61		23.61	
\$23.61	Mar. 20	\$23.45	Jan. 2
23.45	Dec. 23	22.61	Jan. 2
22.61	Sept. 19	20.61	Sept. 12
23.25	June 21	19.61	July 6
23.25	Mar. 9	20.25	Feb. 16
19.74	Nov. 24	18.73	Aug. 11
18.84	Nov. 5	17.83	May 14
17.90	May 1	16.90	Jan. 27
16.90	Dec. 5	13.56	Jan. 3
14.81	Jan. 5	13.56	Dec. 6
15.90	Jan. 6	14.79	Dec. 15
18.21	Jan. 7	15.90	Dec. 16
18.71	May 14	18.21	Dec. 17

## SCRAP STEEL

.....\$35.58 per gross ton.....  
 .....\$35.58 per gross ton.....  
 .....\$32.00 per gross ton.....  
 .....\$19.17 per gross ton.....

## HIGH

\$39.67	Mar. 18	\$29.50	May 20
31.17	Dec. 24	19.17	Jan. 1
19.17	Jan. 2	18.92	May 22
19.17	Jan. 11	15.76	Oct. 24
\$19.17		\$19.17	
19.17		19.17	
\$22.00	Jan. 7	\$19.17	Apr. 10
21.83	Dec. 30	16.04	Apr. 9
22.50	Oct. 3	14.08	May 16
15.00	Nov. 22	11.00	June 7
21.92	Mar. 30	12.67	June 9
17.75	Dec. 21	12.67	June 8
13.42	Dec. 10	10.33	Apr. 29
13.00	Mar. 13	9.50	Sept. 25
12.25	Aug. 8	6.75	Jan. 3
8.50	Jan. 12	6.43	July 5
11.33	Jan. 6	8.50	Dec. 29
15.00	Feb. 18	11.25	Dec. 9
17.58	Jan. 29	14.08	Dec. 8

**LOW**

Weighted index based on steel bars, shapes, plates, wire, rails, black pipe, hot and cold-rolled sheets and strip, representing 66 pct of the United States output. Index recapitulated in Aug. 28, 1941, issue.

Based on averages for basic iron at Valley furnaces and foundry iron at Chicago, Philadelphia, Buffalo, Valley and Birmingham.

Based on No. 1 heavy melting steel scrap quotations to consumers at Pittsburgh, Philadelphia and Chicago.



# KAYDON BEARINGS

IN  
KAUKAUNA'S  
INDEXING  
TABLE



KAYDON FLAT RACE BALL  
THRUST BEARING,  
24.000" x 28.000" x 1.000".  
RACES .3125" THICK—  
HELD TO  
.001 parallelism.



As builders of precision metalworking machines, Kaukauna Machine Corporation, Kaukauna, Wisconsin, engineered this 2¼ ton Indexing Table to support heavy work pieces, without deflection, for machine tools, and for inspection and layout work.

The center of the main bed of this table is a 36" diameter indexing platen. Support of this platen demands an extremely large, rugged, precision bearing of big capacity.

Kaukauna engineers found KAYDON Bearings met their requirements, just as many other designers of heavy-duty machinery have found KAYDON Bearings improve ponderous oil field equipment, huge grinders, steel mill and paper mill machines, road-building units, excavators, hoists, bending machines and other heavy duty machines.

Contact KAYDON for bearing cooperation.

KAYDON Types of Standard or Special Bearings:  
Spherical Roller • Taper Roller • Ball Radial  
Ball Thrust • Roller Radial • Roller Thrust

**THE KAYDON ENGINEERING CORP., MUSKEGON, MICH.**

*All types of Ball and Roller Bearings 4" bore to 120" outside diameter*

# Iron and Steel Prices . . .

Steel prices shown here are f.o.b. basing points in cents per pound of dollars per gross ton. Extras apply. Delivered prices do not reflect 3 pct tax on freight. Industry practice has discontinued arbitrary f.o.b. prices at Gulf and Pacific Ports. Space limitations prevent quotation of delivered prices at major ports. (1) Commercial quality sheet grade; primes, 25c above base. (2) Commercial quality grade (3) Widths up to 12-in. inclusive. (4) 0.25 carbon and less. (5) Applies to certain width and length limitations. (6) For merchant trade. (7) For straight length material only from producer to consumer. (8) Also shafting. For quantities of 20,000 lb to 89,999 lb. (9) Carload lot in manufacturing trade. (10) Delivered Los Angeles only. (11) Boxed. (12) Produced to dimensional tolerances in AISI Manual Sec. 6. (13) Delivered San Francisco only: Includes 3 pct freight tax. (14) Delivered Kaiser Co. prices: includes 3 pct freight tax. (15) 0.035 to 0.075 in. thick by 3/4 to 3 1/2 in. wide. (16) Some sales are at higher prices. (17) Delivered Los Angeles; add 1/2¢ per 100 lb for San Francisco.

Basing Point's	Pitts- burgh	Chicago	Gary	Cleve- land	Birm- ingham	Buffalo	Youngs- town	Spar- rows Point	Granite City	Middle- town, Ohio	San Franc'co, Los Angeles, Seattle	DELIVERED TO		
												Detroit	New York	Phila- delphia
<b>INGOTS</b>														
Carbon, rerolling														
Carbon, forging	\$40.00	\$40.00	\$40.00	\$40.00	\$40.00	\$40.00	\$40.00							
Alloy	\$52.00													
<b>BILLETS, BLOOMS, SLABS</b>														
Carbon, rerolling	\$42.00	\$42.00	\$42.00	\$42.00	\$42.00	\$42.00	\$42.00					\$45.00		
Carbon, forging billets	\$50.00	\$50.00	\$50.00	\$50.00	\$50.00	\$50.00	\$50.00					\$53.00		
Alloy	\$61.00	\$61.00				\$61.00						\$64.00		
<b>SHEET BARS</b>							\$53.00			Portsmouth, Ohio = \$67.20				
<b>PIPE SKELP</b>	2.35¢	2.35¢					2.35¢	2.35¢		(Coatesville = 2.35¢)				
<b>WIRE RODS</b>	2.55¢	2.55¢		2.55¢	2.55¢					(Worcester = 2.65¢)	3.27¢ <sup>13</sup>			
<b>SHEETS</b>														
Hot-rolled	2.50¢	2.50¢	2.50¢	2.50¢	2.50¢	2.50¢	2.50¢	2.50¢	2.875¢	2.50¢	3.24¢ <sup>17</sup>	2.65¢	2.79¢	2.70¢
Cold-rolled <sup>1</sup>	3.20¢	3.20¢	3.20¢	3.20¢		3.20¢	3.20¢		3.30¢			3.35¢	3.61¢	3.58¢
Galvanized (10 gage)	3.55¢	3.55¢	3.55¢		3.55¢		3.55¢	3.55¢	3.65¢		4.32¢ <sup>17</sup>		3.84¢	3.75¢
Enameling (12 gage)	3.55¢	3.55¢	3.55¢	3.55¢			3.55¢		3.65¢			3.70¢	3.95¢	3.93¢
Long ternes <sup>2</sup> (10 gage)	3.55¢	3.55¢	3.55¢										3.95¢	3.91¢
<b>STRIP</b>														
Hot-rolled <sup>3</sup>	2.50¢	2.50¢	2.50¢	2.50¢ <sup>15</sup>	2.50¢		2.50¢					2.65¢	2.93¢	2.88¢
Cold-rolled <sup>4</sup>	3.20¢	3.30¢		3.20¢			3.20¢			(Worcester = 3.40¢)		3.35¢	3.61¢	3.58¢
Cooperage stock	2.80¢	2.80¢			2.80¢		2.80¢						3.09¢	
<b>TINPLATE</b>														
Standard cokes, base box	\$5.75	\$5.75	\$5.75		\$5.85			\$5.85	\$5.85		(Warren, Ohio = \$5.75)	\$6.157	\$6.062 <sup>11</sup>	
Electro, box (0.25 lb. 0.50 lb. 0.75 lb.)														
<b>BLACKPLATE, 29 gage<sup>5</sup></b>	3.60¢	3.60¢	3.60¢		3.70¢			3.70¢	3.70¢		(Warren, Ohio = \$5.75)	3.99¢	3.90¢	
<b>BLACKPLATE, CANMAKING</b> 55 lb. to 70 lb. 75 lb. to 95 lb. 100 lb. to 118 lb.														
<b>TERNES, MFG., Special coated</b>														
<b>BARS</b>														
Carbon steel	2.60¢	2.60¢	2.60¢	2.60¢	2.60¢	2.60¢	2.60¢				3.285¢	2.75¢	3.01¢	2.98¢
Rail steel <sup>6, 16</sup>	2.60¢	2.60¢	2.60¢	2.60¢	2.60¢	2.60¢								
Reinforcing (billet) <sup>7</sup>	2.45¢	2.45¢	2.45¢	2.45¢	2.45¢	2.45¢	2.45¢	2.45¢			2.985¢		2.74¢	2.65¢
Reinforcing (rail) <sup>7, 16</sup>	2.95¢	2.95¢	2.95¢	2.95¢	2.95¢	2.95¢	2.95¢							
Cold-finished <sup>8</sup>	3.20¢	3.20¢	3.20¢	3.20¢		3.20¢						3.35¢	3.61¢	3.58¢
Alloy, hot-rolled	3.05¢	3.05¢				3.05¢	3.05¢			(Bethlehem, Massillon, Canton = 3.05¢)		3.20¢		3.19¢
Alloy, cold-drawn	3.80¢	3.80¢	3.80¢	3.80¢		3.80¢						3.95¢		
<b>PLATE</b>														
Carbon steel <sup>12</sup>	2.65¢	2.65¢	2.65¢	2.65¢	2.65¢		2.65¢			(Coatesville = 2.80¢, Claymont = 2.90¢, Geneva, Utah = 2.80¢)	3.46¢ <sup>14</sup>	2.87¢	2.85¢	
Floor plates	3.90¢	3.90¢											4.30¢	4.28¢
Alloy	3.79¢	3.79¢								(Coatesville = 4.10¢)			4.01¢	3.895¢
<b>SHAPES, Structural</b>	2.50¢	2.50¢	2.50¢		2.50¢	2.50¢				(Geneva, Utah = 2.65¢) (Bethlehem = 2.50¢)	3.17¢ <sup>10</sup>		2.70¢	2.64¢
<b>SPRING STEEL, C-R</b> 0.26 to 0.40 carbon	3.20¢			3.20¢						(Worcester = 3.40¢)				
0.41 to 0.60 carbon	4.70¢			4.70¢						(Worcester = 4.90¢)				
0.61 to 0.80 carbon	5.30¢			5.30¢						(Worcester = 5.50¢)				
0.81 to 1.00 carbon	6.80¢			6.80¢						(Worcester = 7.00¢)				
Over 1.00 carbon	9.10¢			9.10¢						(Worcester = 9.30¢)				
<b>MANUFACTURERS' WIRE<sup>9</sup></b>														
Bright	3.30¢	3.30¢		3.30¢	3.30¢					(Worcester = 3.40¢, Duluth = 3.35¢)	4.31¢ <sup>13</sup>		3.71¢	3.68¢
Galvanized										Add proper size extra and galvanizing extra to Bright Wire Base				
Spring (high carbon)	4.25¢	4.25¢		4.25¢						(Worcester = 4.35¢, Duluth = 4.50¢) (Trenton = 4.50¢)	5.28¢ <sup>13</sup>		4.66¢	4.595¢
<b>PILING, Steel sheet</b>	3.00¢	3.00¢				3.00¢							3.41¢	3.36¢



# PRICES

## CORROSION AND HEAT RESISTANT STEELS

In cents per pound, f.o.b. basing point

Basing Point	Chromium Nickel		Straight Chromium			
	No. 304	No. 302	No. 410	No. 430	No. 442	No. 446
Ingot, P'gh, Chi, Canton, Balt, Reading, Ft. Wayne, Phila.	Subject to negotiation			Subject to negotiation		
Blooms, P'gh, Chi, Canton, Phila, Reading, Ft. Wayne, Balt	22.99	24.67	17.01	17.47	20.69	25.29
Slabs, P'gh, Chi, Canton, Balt, Phila, Reading	22.99	24.67	17.01	17.47	20.69	25.29
Billets, P'gh, Chi, Canton, Watervliet, Syracuse, Balt	Subject to negotiation			Subject to negotiation		
Billets, forging, P'gh, Chi, Canton, Dunkirk, Balt, Phila, Reading, Water, Syracuse, Ft. Wayne, Titusville	23.00	22.50	17.50	17.50	21.00	25.50
Bars, h-r, P'gh, Chi, Canton, Dunkirk, Watervliet, Syracuse, Balt, Phila, Reading, Ft. Wayne, Titusville	27.50	26.00	20.50	21.00	24.50	30.00
Bars, c-f, P'gh, Chi, Cleve, Canton, Dunkirk, Syracuse, Balt, Phila, Reading, Ft. Wayne, Watervliet	27.50	26.00	20.50	21.00	24.50	30.00
Plates, P'gh, Middletown, Canton	31.50	29.50	23.50	24.00	28.00	33.00
Shapes, structural, P'gh, Chi	27.50	26.00	20.50	21.00	24.50	30.00
Sheets, P'gh, Chi, Middletown, Canton, Balt	39.00	37.00	29.00	31.50	35.50	39.50
Strip, h-r, P'gh, Chi, Reading, Canton, Youngstown	25.50	23.50	18.50	19.00	26.00	38.00
Strip, c-r, P'gh, Cleve, Newark, N. J., Reading, Canton, Youngstown	32.50	30.50	24.00	24.50	35.00	56.50
Wire, c-d, Cleve, Dunkirk, Syracuse, Balt, Reading, Canton, P'gh, Newark, N. J., Phila, Ft. Wayne	27.50	26.00	20.50	21.00	24.50	30.00
Wire, flat, c-r, Cleve, Balt, Reading, Dunkirk, Canton	32.46	30.30	23.80	24.34	34.62	56.26
Rod, h-r, Syracuse	27.05	25.97	20.02	20.56	24.34	29.75
Tubing, seamless, P'gh, Chi, Canton (4 to 6 in.)	72.09	72.09	.....	68.49	.....	.....

## TOOL STEEL

(F.o.b. Pittsburgh, Bethlehem, Syracuse, Dunkirk. \*Also Canton, Ohio)

W	Cr	V	Mo	Base per lb
18	4	1	—	74¢
1.5	4	1.5	8	59¢
6	4	2	6	63¢
High-carbon-chromium*				47¢
Oil hardening manganese*				26¢
Special carbon*				24¢
Extra carbon*				20¢
Regular carbon*				16¢

Warehouse prices on and east of Mississippi are 2¢ per lb. higher; west of Mississippi, 4¢ higher.

## ELECTRICAL SHEETS

Base, all grades f.o.b. Pittsburgh

	Per lb
Field grade	4.20¢
Armature	4.50¢
Electrical	5.00¢
Motor	5.75¢
Dynamo	6.45¢
Transformer 72	6.95¢
Transformer 65	7.65¢
Transformer 58	8.35¢
Transformer 52	9.15¢

F.o.b. Chicago and Gary, field grade through motor; f.o.b. Granite City, add 10¢ per 100 lb on field grade to and including dynamo.

## RAILS, TRACK SUPPLIES

(F.o.b. mill)

Standard rails, heavier than 60 lb	
No. 1 O.H., per 100 lb.	\$2.50
Angle splice bars, 100 lb.	3.00
(F.o.b. basing points)	per 100 lb
Light rails (from billets)	\$2.85
Light rails (from rail steel), f.o.b. Williamsport, Pa.	2.95

Base per lb

Cut spikes	4.50¢
Screw spikes	6.40¢
Tie plate, steel	2.80¢
Tie plates, Pacific Coast	2.95¢
Track bolts	6.50¢
Track bolts, heat treated, to rail roads	6.75¢
Track bolts, jobbers discount	63-5

Basing points, light rails, Pittsburgh, Birmingham; cut spikes and tie plates—Pittsburgh, Chicago, Portsmouth, Ohio; Weirton, W. Va.; St. Louis, Kansas City, Minnequa, Colo.; Birmingham and Pacific Coast ports; tie plates alone—Steelton, Pa.; Buffalo. Cut spikes alone—Youngstown, Lebanon, Pa.; Richmond.

## ROOFING TERNEPLATE

(F.o.b. Pittsburgh, 112 sheets)

	20x14 in.	20x28 in.
8-lb coating I.C.	\$6.75	\$13.50

## CLAD STEEL

Base prices, cents per pound

	Plate	Sheet
Stainless-clad		
No. 304, 20 pct, f.o.b. Pittsburgh, Washington, Coatesville, Pa.	*24.00	*22.00
Nickel-clad		
10 pct, f.o.b. Coatesville, Pa.	21.50	....
Inconel-clad		
10 pct, f.o.b. Coatesville	30.00	....
Monel-clad		
10 pct, f.o.b. Coatesville	29.00	....
Aluminized steel		
Hot dip, 20 gage, f.o.b. Pittsburgh	....	9.00

\*Includes annealing and pickling, or sandblasting.

## MERCHANT WIRE PRODUCTS

To the dealer f.o.b. Pittsburgh, Chicago, Cleveland, Birmingham, Duluth

	Base Delivered per keg	San Francisco
Standard, galvanized and coated nails	\$3.75†	\$4.83
Cut nails, carloads, Pittsburgh base	5.30	....

†10¢ additional at Cleveland, 30¢ at Worcester.

	Base per 100 lb	
Annealed fence wire	\$3.95†	\$4.96
Annealed galv. fence wire	4.40†	5.41
†10¢ additional at Worcester.		
To the dealer f.o.b. Pittsburgh, Chicago, Birmingham		

	Base	column
Woven wire fence*	84	107
Fence posts, carloads	90††	...
Single loop bale ties	86	110
Galvanized barbed wire**	94	114
Twisted barless wire	90	...

\* 15½ gage and heavier. \*\* On 80-rod spools in carload quantities. ††Pittsburgh, Duluth.

## HIGH STRENGTH, LOW ALLOY STEELS

base prices, cents per pound

Steel	Aldcor	Corten	Double Strength No. 1	Dynalloy	HI Steel	Mayari R	Otiscoloy	Yoloy	NAX High Tensile
Producer	Repub-lic	Carnegie-Illinois, Republic	Repub-lic	Alan Wood	Inland	Bethlehem	Jones & Laughlin	Youngstown Sheet & Tube	Great Lakes Steel
Plates	4.10	4.10	4.10	4.10	4.10	4.10	4.10	4.10	4.10
Sheets									
Hot-rolled	3.85	3.85	3.85	3.85	3.85	3.85	3.85	3.85	3.85
Cold-rolled	4.75	4.75	4.75	....	4.75	4.75	4.75	4.75	4.75
Galvanized	....	5.40	....	....	....	5.40	....	....	....
Strip									
Hot-rolled	3.85	3.85	3.85	....	3.85	3.85	3.85	3.85	3.85
Cold-rolled	....	....	4.75	....	....	4.75	4.75	4.75	4.75†
Shapes		3.85	....	....	3.85	3.85	3.85	3.85	....
Beams		3.85	....	....	....	3.85	....	....	....
Bars									
Hot-rolled	4.00	4.00	4.00	....	....	4.00	4.00	4.00	4.00
Cold-rolled	....	....	....	....	....	....	....	4.60	....
Bar shapes	....	4.00	....	....	4.00	4.00	4.00	4.00	....

† Pittsburgh, add 0.10¢ at Chicago and Gary.

## PRICES

### PIPE AND TUBING

Base discounts. F.o.b. Pittsburgh and Lorain, steel butt weld and seamless. Others f.o.b. Pittsburgh only  
Base price, \$200.00 per net ton

#### Standard, threaded & coupled

Steel, butt weld	Black	Galv.
1/2-in. ....	55 1/2	41
3/4-in. ....	58 1/2	45
1 to 3-in. ....	60 1/2	47 1/2

#### Wrought Iron, butt weld

1/2-in. ....	2	+20
3/4-in. ....	11 1/2	+10
1 and 1 1/4-in. ....	17	+2
1 1/2-in. ....	22 1/2	1 1/2
2-in. ....	23	2

#### Steel, lap weld

2-in. ....	53	39 1/2
2 1/2 and 3-in. ....	56	42 1/2
3 1/2 to 6-in. ....	58	44 1/2

#### Steel, seamless

2-in. ....	52	38 1/2
2 1/2 and 3-in. ....	55	41 1/2
3 1/2 to 6-in. ....	57	43 1/2

#### Wrought Iron, lap weld

2-in. ....	14 1/2	+5 1/2
2 1/2 to 3 1/2-in. ....	17	+1 1/2
4-in. ....	21	4
4 1/2 to 8-in. ....	19	2 1/2

#### Extra Strong, plain ends

Steel, butt weld		
1/2-in. ....	54 1/2	41 1/2
3/4-in. ....	58 1/2	45 1/2
1 to 3-in. ....	60	48

#### Wrought Iron, butt weld

1/2-in. ....	6 1/2	+14
3/4-in. ....	12 1/2	+8
1 to 2-in. ....	22	2

#### Steel, lap weld

2-in. ....	52	39 1/2
2 1/2 and 3-in. ....	56	43 1/2
3 1/2 to 6-in. ....	59 1/2	47

#### Steel, seamless

2-in. ....	51	38 1/2
2 1/2 and 3-in. ....	55	42 1/2
3 1/2 to 6-in. ....	58 1/2	46

#### Wrought Iron, lap weld

2-in. ....	17 1/2	+2
2 1/2 to 4-in. ....	26	8 1/2
4 1/2 to 6-in. ....	22	4

Basing discounts for standard pipe are for threads and couplings. For threads only, butt weld, lap weld and seamless pipe, one point higher discount (lower price) applies. For plain ends, butt weld, lap weld and seamless pipe 3-in. and smaller, three points higher discount (lower price) applies, while for lap weld and seamless 3 1/2-in. and larger four points higher discount (lower price) applies. F.o.b. Gary prices are one point lower discount on all butt weld. On butt weld and lap weld steel pipe, jobbers are granted a discount of 5 pct. On l.c.l. shipments, prices are determined by adding 25 pct and 30 pct and the carload freight rate to the base card.

### BOILER TUBES

Seamless steel and electric welded commercial boiler tubes and locomotive tubes, minimum wall. Net base prices per 100 ft, f.o.b. Pittsburgh in carload lots, cut length 4 to 24 ft, inclusive.

		Seamless		Electric Weld	
OD Gage		Hot-	Cold-	Hot-	Cold-
in in. BWG		Rolled	Drawn	Rolled	Drawn
2	13	\$15.29	\$18.17	\$15.00	\$17.95
2½	12	20.57	24.43	20.11	24.07
3	12	22.87	27.18	22.26	26.68
3½	11	28.86	34.30	28.06	33.64
4	10	35.82	42.55	34.78	41.68

### CAST IRON WATER PIPE

	Per net ton
6-in. to 24-in. del'd Chicago	\$31.56
6-in. to 24-in. del'd New York	79.80
6-in. to 24-in., Birmingham	71.00
6-in. and larger, f.o.b. cars, San Francisco, Los Angeles for all rail shipment; rail and water shipment less	95.00
Class "A" and gas pipe, \$5 extra; 4-in. pipe is \$5 a ton above 6-in.	

### BOLTS, NUTS, RIVETS, SET SCREWS

#### Bolts and Nuts

(F.o.b. Pittsburgh, Cleveland, Birmingham or Chicago)

#### Machine and Carriage Bolts

Base discount less case lots	Percent Off List
1/2 in. & smaller x 6 in. & shorter	48
9/16 & 5/8 in. x 6 in. & shorter	50
All larger diam and longer lengths	47
Lag, all diam over 6 in. long	48
Lag, all diam x 6 in. & shorter	50
Plow bolts	57

#### Nuts, Cold Punched or Hot Pressed

(Hexagon or Square)	
1/2 in. and smaller	48
9/16 to 1 in. inclusive	47
1 1/4 to 1 1/2 in. inclusive	45
1 1/2 in. and larger	40

On above bolts and nuts, excepting plow bolts, additional allowance of 15 pct for full container quantities. There is an additional 5 pct allowance for carload shipments.

#### Semifin. Hexagon Nuts USS SAE

Base discount less case lots	
7/16 in. and smaller	51
1/2 in. and smaller	50
1/2 in. through 1 in.	48
9/16 in. through 1 in.	49
1 1/4 in. through 1 1/2 in.	47
1 1/2 in. and larger	40

In full case lots, 15 pct additional discount. For 200 lb or more, freight allowed up to 50¢ per 100 lb, based on Cleveland, Chicago, Pittsburgh.

#### Stove Bolts

Consumer	
Packages, nuts separate	65 and 10
In bulk	75
On stove bolts freight allowed up to 65¢ per 100 lb based on Cleveland, Chicago, New York on lots of 200 lb or over.	

#### Large Rivets

(1/2 in. and larger)	
Base per 100 lb	
F.o.b. Pittsburgh, Cleveland, Chicago, Birmingham	\$5.25
F.o.b. Lebanon, Pa.	5.40

#### Small Rivets

(7/16 in. and smaller)	
Percent Off List	
F.o.b. Pittsburgh, Cleveland, Chicago, Birmingham	55 and 5

#### Cap and Set Screws

Percent Off List	Consumer
(In packages)	
Hexagon head cap screws, coarse or fine thread, up to and incl. 1 in. x 6 in., SAE 1020, bright	56
1/2 to 1 in. x 6 in., SAE 1035, heat treated	47
Set screws, cup and oval points	61
Milled studs	33
Flat head cap screws, listed sizes	21
Fillister head cap, listed sizes	40
Freight allowed up to 65¢ per 100 lb based on Cleveland, Chicago or New York on lots of 200 lb or over.	

### FLUORSPAR

Metallurgical grade, f.o.b. producing plant.

Effective CaF <sub>2</sub> Content:	Base price per short ton
70% or more	\$33.00
65% but less than 70%	32.00
60% but less than 65%	31.00
Less than 60%	30.00

### LAKE SUPERIOR ORES

(51.50% Fe, Natural Content, Delivered Lower Lake Ports)

	Per Gross Ton
Old range, bessemer	\$5.95
Old range, nonbessemer	5.80
Mesabi, bessemer	5.70
Mesabi, nonbessemer	5.55
High phosphorus	5.55
Prices quoted retroactive to Jan. 1, 1947.	

### METAL POWDERS

Prices in cents per pound in ton lots, f.o.b. shipping point.

Brass, minus 100 mesh	24¢ to 28 1/2¢
Copper, electrolytic, 100 and 325 mesh	30¢ to 31 1/2¢
Copper, reduced, 150 and 200 mesh	29¢ to 30 1/2¢
Iron, commercial, 100, 200, 325, mesh 96 + % Fe carlots	10¢ to 15¢
Swedish sponge iron, 100 mesh, c.i.f. N. Y., carlots, ocean bags	7.4¢ to 8.5¢
Iron, crushed, 200 mesh and finer, 90 + % Fe carload lots	5¢
Iron, hydrogen reduced, 300 mesh and finer, 98 + % Fe, drum lots	63¢ to 80¢
Iron, electrolytic, unannealed, 325 mesh and coarser, 99 + % Fe	35¢ to 37¢
Iron, electrolytic, annealed minus 100 mesh, 99 + % Fe	29¢ to 31¢
Iron carbonyl, 300 mesh and finer, 98-99.8 + % Fe	90¢ to \$1.75
Aluminum, 100, 200 mesh, carlots	23¢ to 26¢
Antimony, 100 mesh	36.05¢
Cadmium, 100 mesh	\$2.00
Chromium, 100 mesh and finer	\$1.025
Lead, 100, 200, & 300 mesh	18.50¢ to 23.50¢
Manganese, minus 325 mesh and coarser	49¢
Nickel, 150 mesh	51 1/4¢
Silicon, 100 mesh	26¢
Solder powder, 100 mesh. 8 1/4¢ plus metal	
Stainless steel, 302, minus 100 mesh	75¢
Tin, 100 mesh	90¢
Tungsten metal powder, 98%-99%, any quantity, per lb.	\$2.90
Molybdenum powder, 99%, in 100-lb kegs, f.o.b. York, Pa., per lb.	\$2.65
Under 100 lb	\$2.90

### COKE

Furnace, beehive (f.o.b. oven)	Net Ton
Connellsville, Pa.	\$10.00 to \$11.00
Foundry, beehive (f.o.b. oven)	
Connellsville, Pa.	11.00 to 12.00
Foundry, Byproduct	
Chicago, del'd	\$16.10
Chicago, f.o.b.	15.10
New England, del'd	17.25
Seaboard, Kearney, N. J., f.o.b.	15.35
Philadelphia, del'd	15.46
Buffalo, del'd	16.14
Ashland, Ohio, f.o.b.	13.35
Painesville, Ohio, f.o.b.	14.60
Erie, del'd	15.75
Cleveland, del'd	15.90
Cincinnati, del'd	15.39
St. Louis, del'd	15.85
Birmingham, del'd	13.25

### REFRACTORIES

(F.o.b. Works)

#### Fire Clay Brick

	Carloads, Per 1000
First quality, Ohio	\$64.00
First quality, Pa., Md., Ky., Mo.	70.00
First quality, New Jersey	75.00
Sec. quality, Pa., Md., Ky., Mo.	64.00
Sec. quality, New Jersey	59.00
Sec. quality, Ohio	56.00
Ground fire clay, net ton, bulk	10.00

#### Silica Brick

Pennsylvania and Birmingham	\$70.00
Chicago District	79.00
Silica cement, net ton (Eastern)	12.00
East Chicago	13.00

#### Chrome Brick

Standard chemically bonded, Balt., Plymouth Meeting, Chester	Per Net Ton \$59.00
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#### Magnesite Brick

Standard, Balt. and Chester	\$81.00
Chemically bonded, Baltimore	70.00

#### Grain Magnesite

Domestic, f.o.b. Balt. and Chester in bulk	\$44.50
Domestic, f.o.b. Chewelah, Wash., in bulk	24.00
in sacks	28.00
Clinker (dead burned) dolomite, bulk, per net ton, f.o.b. Billmeyer, Pa., Millersville, Ohio	10.55
Midwest, add 10¢; Mo. Valley, add 20¢	



# PRICES

## WAREHOUSE PRICES

Base prices, delivered metropolitan areas, per 100 lb.

CITIES	SHEETS			STRIP		Plates	Standard Structural Shapes	BARS		ALLOY BARS			
	Hot-Rolled	Cold-Rolled	Galvanized (10 gage)	Hot-Rolled	Cold-Rolled			Hot-Rolled	Cold-Finished	Hot-Rolled, A 4815 As-rolled	Hot-Rolled, A 4140-50 Ann.	Cold-Drawn, A 4815 As-rolled	Cold-Drawn, A 4140-50 Ann.
Philadelphia	\$4.14	\$5.18	\$5.29	\$4.43	\$5.28	\$4.44	\$4.22	\$4.48	\$5.13	\$8.37	\$8.37	\$9.88	\$9.88
New York	4.22	5.17 <sup>1</sup>	5.47	4.62	5.40	4.62	4.37	4.62	5.17	8.42	8.42	9.92	9.92
Boston	4.40	5.22	4.95 <sup>12</sup>	4.65	6.36	4.70	4.47	4.62	5.22	8.62	8.62	9.97	9.97
Baltimore	3.89	.....	5.14	4.40	.....	4.39	4.34	4.45	5.10	.....	.....	.....	.....
Norfolk	4.15	.....	.....	.....	.....	4.50	4.50	4.75	5.50	.....	.....	.....	.....
Chicago	3.65	.....	.....	4.05	5.05	4.25	4.10	4.10	4.75	8.10	8.10	9.35	9.35
Milwaukee	4.099	4.899 <sup>1</sup>	5.249	4.199	.....	4.399	4.249	4.249	4.899	8.399	8.399	9.649	9.649
Cleveland	3.95	4.55	5.238	4.188	5.00	4.25 <sup>1</sup>	4.311	4.10	4.75	8.358	8.358	9.35	9.35
Buffalo	4.15	4.85 <sup>1</sup>	5.35	4.30	5.25	4.55	4.10	4.10	4.75	8.10	8.10	9.35	9.35
Detroit	4.05	4.85	5.42	4.34	5.24	4.49 <sup>1</sup>	4.42	4.20	4.67	8.51	8.51	9.74	9.74
Cincinnati	3.916	4.716	5.166	.....	.....	4.553	4.444	4.403	5.053	.....	.....	.....	.....
St. Louis	3.999	4.799 <sup>1</sup>	5.424	4.199	5.424	4.399	4.249	4.249	5.074	8.574	8.574	9.824	9.824
Pittsburgh	3.95	4.65 <sup>1</sup>	5.10	4.05	4.95	4.25	4.10	4.10	4.75	8.10	8.10	9.35	9.35
St. Paul	4.284 <sup>7</sup>	5.084 <sup>1</sup>	5.434 <sup>2</sup>	4.384 <sup>7</sup>	.....	4.584 <sup>7</sup>	4.434 <sup>7</sup>	4.434 <sup>7</sup>	5.476 <sup>8</sup>	.....	7.084 <sup>6</sup>	.....	.....
Omaha	4.668	6.118 <sup>1</sup>	5.918	4.868	.....	5.068	4.918	4.918	5.818	.....	.....	.....	.....
Indianapolis	3.84	4.84	5.29	4.24	5.01	4.51	4.36	4.56	5.01	.....	.....	.....	.....
Birmingham	4.15 <sup>11</sup>	.....	5.25	4.15 <sup>11</sup>	.....	4.35 <sup>11</sup>	4.10 <sup>11</sup>	4.10 <sup>11</sup>	5.58	.....	.....	.....	.....
Memphis	4.27	.....	5.97	4.72	.....	4.92	4.67	4.67	5.78	.....	.....	.....	.....
New Orleans	*4.68 <sup>11</sup>	5.94 <sup>1</sup>	.....	4.88 <sup>11</sup>	.....	5.03 <sup>11</sup>	*4.73 <sup>11</sup>	*4.83 <sup>11</sup>	5.94 <sup>6</sup>	.....	.....	.....	.....
Los Angeles	5.15	7.00 <sup>1</sup>	6.70	5.65	8.35 <sup>5</sup>	5.10	5.20	5.10	6.90 <sup>14</sup>	10.15	9.35	11.05	11.05
San Francisco	4.70 <sup>8</sup>	6.30 <sup>9</sup>	6.45	5.20 <sup>8</sup>	.....	5.00 <sup>8</sup>	4.90 <sup>8</sup>	4.75 <sup>8</sup>	7.00 <sup>10</sup>	.....	.....	.....	.....
Seattle	4.80 <sup>4</sup>	6.75 <sup>2</sup>	6.30	5.30 <sup>4</sup>	.....	5.15 <sup>4</sup>	4.95 <sup>4</sup>	5.00 <sup>4</sup>	7.10 <sup>14</sup>	.....	9.50 <sup>6</sup>	.....	10.85 <sup>6</sup>
Portland	5.00 <sup>4</sup>	.....	6.25	5.50 <sup>4</sup>	.....	5.25 <sup>4</sup>	5.10 <sup>4</sup>	5.10 <sup>4</sup>	7.20	.....	9.30 <sup>6</sup>	.....	.....
Salt Lake City	5.65	.....	7.10	6.35	.....	5.70	5.85	5.95	7.00	.....	.....	.....	.....

## BASE QUANTITIES

Standard unless otherwise keyed on prices.

**HOT-ROLLED:** Sheets, strip, plates, shapes and bars, 400 to 1999 lb.

**COLD-ROLLED:** Sheets, 400 to 1999 lb;

strip, extras on all quantities; bars 1000 lb and over.

**ALLOY BARS:** 1000 lb and over.

**GALVANIZED SHEETS:** 450 to 1499 lb.

**EXCEPTIONS:** (1) 400 to 1499 lb; (2) 450 to 1499 lb; (3) 300 to 4999 lb; (4) 300 to 999 lb; (5) 2000 lb and over; (6) 1000 lb

and over; (7) 400 to 14,999; (8) 400 lb and over; (9) 450 to 1499; (10) 500 to 999; (11) 400 to 3999; (12) 450 to 3749; (13) 400 to 1999; (14) 1500 and over.

\* Add 46¢ for sizes not rolled in Birmingham.

† Up to ¾ in. thick and 90 in. wide.

## PIG IRON PRICES

Dollars per gross ton. Delivered prices represent minimums.

BASING POINT PRICES						DELIVERED PRICES (BASE GRADES)							
Basing Point	Basic	No. 2 Foundry	Malleable	Bessemer	Low Phos.	Consuming Point	Basing Point	Freight Rate	Basic	No. 2 Foundry	Malleable	Bessemer	Low Phos.
Bethlehem	34.00	34.50	35.00	35.50	.....	Boston	Everett	\$0.50 Arb.	.....	45.50	46.00	.....	.....
Birdsboro	40.00	40.50	41.00	41.50	45.00	Boston	Steelton	4.82	.....	.....	.....	.....	43.82
Birmingham	29.38	29.88	.....	.....	.....	Brooklyn	Bethlehem	3.00	37.00	37.50	38.00	38.50	.....
Buffalo	32.50	33.00	33.50	.....	.....	Brooklyn	Birdsboro	3.50	.....	.....	.....	.....	48.50
Chicago	32.50	33.00	33.50	34.00	.....	Cincinnati	Birmingham	4.87	34.25	34.75	.....	.....	.....
Cleveland	32.50	33.00	33.50	.....	.....	Jersey City	Bethlehem	1.84	35.84	36.34	36.84	37.34	.....
Duluth	33.00	33.50	34.00	34.50	.....	Jersey City	Birdsboro	2.33	.....	.....	.....	.....	47.33
Erie	32.50	33.00	33.50	34.00	.....	Los Angeles	Provo	5.94	38.94	39.44	.....	.....	.....
Everett	.....	45.00	45.50	.....	.....	Mansfield	Cleveland-Toledo	2.33	34.83	35.33	35.83	36.33	.....
Granite City	32.50	33.50	33.50	.....	.....	Philadelphia	Bethlehem	1.67	35.67	.....	.....	.....	.....
Neville Island	33.00	33.50	33.50	34.00	.....	Philadelphia	Swedeland	1.01	36.01	36.51	37.01	37.51	.....
Provo	33.00	33.50	.....	.....	.....	Philadelphia	Steelton	2.15	.....	.....	.....	.....	41.15
Sharpville	33.00	33.50	33.50	34.00	.....	San Francisco	Provo	5.94	38.94	39.44	.....	.....	.....
Steelton	34.00	.....	.....	.....	39.00	Seattle	Provo	5.94	38.94	39.44	.....	.....	.....
Struthers, Ohio	33.50	.....	.....	.....	.....	St. Louis	Granite City	0.75 Arb.	33.25	34.25	34.25	.....	.....
Swedeland	35.00	35.50	36.00	36.50	.....								
Toledo	32.50	33.00	33.50	34.00	.....								
Troy, N. Y.	34.00	34.50	35.00	35.50	39.00								
Youngstown	33.00	33.50	33.50	34.00	.....								

Basing point prices are subject to switching charges; silicon differentials (not to exceed 50¢ per ton for each 0.25 pct silicon content in excess of base grade which is 1.75 to 2.25 pct); phosphorus differentials, a reduction of 38¢ per ton for phosphorus content of 0.70 pct and over; manganese differentials, a charge not to exceed 50¢ per ton for each 0.50 pct manganese content in excess of 1.00

pct. \$2 per ton extra may be charged for 0.5 to 0.75 pct nickel content and \$1 per ton extra for each additional 0.25 pct nickel.

Silvery iron silicon 6.00 to 6.50 pct, C/L per g.t., f.o.b. Jackson, Ohio—\$42.50; f.o.b. Buffalo—\$43.75. Add \$1.00 per ton for each additional 0.50 pct Si, up to 12 pct. Add 50¢ per ton for each 0.50 pct Mn over 1.00 pct. Add \$1.00 per ton for 0.75 pct or more P.

Bessemer ferrosilicon prices are \$1.00 per ton above silvery iron prices of comparable analysis.

Charcoal pig iron base price for low phosphorous \$43.00 per gross ton, f.o.b. Lyles, Tenn. Delivered to Chicago, \$48.49. High phosphorous charcoal pig iron is not being produced.

# FERROALLOY PRICES

## Ferromanganese

78-82% Mn, maximum contract base price, gross ton, lump size, f.o.b. Baltimore, Philadelphia, New York, Birmingham, Rockwood, Tenn.

Carload lots (bulk)	\$135.00
Less ton lots (packed)	157.00
Delivered Pittsburgh	140.25
\$1.70 for each 1% above 82% Mn; penalty, \$1.70 for each 1% below 78%.	
Briquets—Cents per pound of briquet, freight allowed, 66% contained Mn.	
Eastern Central Western	
Carload, bulk	7.00 7.25 7.80
Ton lots	8.00 8.60 10.50
Less ton lots	8.40 9.00 10.90

## Spiegeleisen

Contract prices, gross ton, lump, f.o.b. Palmerton, Pa.

16-19% Mn	19-21% Mn
3% max. Si	3% max. Si
Carloads	\$43.00 \$44.00
F.o.b. Pittsburgh	47.00 48.00

## Manganese Metal

Contract basis, 2 in. x down, cents per pound of metal, f.o.b. shipping point, freight allowed, eastern zone.

96% min. mn, 0.2% max. C, 1% max. Si, 2% max. Fe.	
Carload, bulk	30
L.c.l. lots	32

## Electrolytic Manganese

F.o.b. Knoxville, Tenn., freight allowed east of Mississippi, cents per pound.

Carloads	32
Ton lots	34
Less ton lots	36

## Low-Carbon Ferromanganese

Contract price, cents per pound Mn contained, lump size, f.o.b. shipping point, freight allowed, eastern zone.

	Carloads	Ton	Less
0.06% max. C, 0.06% P, 90% Mn	21.00	22.10	22.70
0.10% max. C	20.50	21.60	22.20
0.15% max. C	20.00	21.10	21.70
0.30% max. C	19.50	20.60	21.20
0.50% max. C	19.00	20.10	20.70
0.75% max. C			
7.00% max. Si	16.00	17.10	17.70

## Silicomanganese

Contract basis, lump size, cents per pound of metal, f.o.b. shipping point, freight allowed, 65-70% Mn, 17-20% Si, 1.5% max. C.

Carload, bulk	6.65
Ton lots	7.70
Briquet, contract basis, carlots, bulk freight allowed, per lb of briquet	6.75
Ton lots	7.75
Less ton lots	8.15

## Silvery Iron (electric furnace)

Si 14.01 to 14.50%, \$64.00 f.o.b. Keokuk, Iowa; \$65.00 f.o.b. Niagara Falls. Add \$1.00 per ton for each additional 0.50% Si up to and including 18%. Add 50¢ per ton for each 0.50 pct Mn over 1 pct.

## Silicon Metal

Contract price, cents per pound contained Si, lump size, f.o.b. shipping point, freight allowed, for ton lots packed.

Eastern Central Western	
96% Si, 2% Fe	16.50 17.85 19.60
97% Si, 1% Fe	16.00 18.25 20.00

## Ferrosilicon Briquets

Contract price, cents per pound of briquet, bulk, f.o.b. shipping point, freight allowed to destination, 40% Si, 1 lb Si briquets.

Eastern Central Western	
Carload, bulk	4.25 4.50 4.70
Ton lots	5.25 5.85 6.15
Less ton lots	5.65 6.25 6.55

## Electric Ferrosilicon

Contract price, cents per pound contained Si, lump size in carloads, f.o.b. shipping point, freight allowed.

Eastern Central Western	
25% Si	11.65
50% Si	7.80 8.30 8.50
75% Si	10.00 10.30 11.05
80-90% Si	11.30 11.60 12.35
90-95% Si	12.80 13.10 13.80

## Ferrochrome (65-72% Cr, 2% max. Si)

Contract prices, cents per pound, contained Cr, lump size in carloads, f.o.b. shipping point, freight allowed.

	Eastern	Central	Western
0.06% C	23.00	23.40	24.00
0.10% C	22.50	22.90	23.50
0.15% C	22.00	22.40	23.00
0.20% C	21.75	22.15	22.25
0.50% C	21.50	21.90	22.00
1.00% C	21.00	21.40	21.50
2.00% C	20.50	20.90	21.00
65-69% Cr,			
4-9% C	15.60	16.00	16.15
62-66% Cr, 4-6% C.			
6-9% Si	16.60	17.00	17.15
Briquets — Contract price, cents per pound of briquet, f.o.b. shipping point, freight allowed, 60% chromium.			
Eastern Central Western			
Carload, bulk	9.85	10.10	10.20
Ton lots	10.75	11.65	12.25
Less ton lots	11.15	12.05	12.65

## High-Nitrogen Ferrochrome

Low-carbon type: 67-72% Cr, 0.75% N. Add 2¢ per lb to regular low carbon ferrochrome price schedule. Add 2¢ for each additional 0.25% N.

## S. M. Ferrochrome

Contract price, cents per pound chromium contained, lump size, f.o.b. shipping point, freight allowed.

High carbon type: 60-65% Cr, 4-6% Si, 4-6% Mn, 4-6% C.

	Eastern	Central	Western
Carload	16.70	17.10	17.25
Ton lots	17.90	19.20	20.00
Less ton lots	18.60	19.90	20.70
Low carbon type: 62-66% Cr, 4-6% Si, 4-6% Mn, 1.25% max. C.			
Eastern Central Western			
Carload	21.00	21.40	21.50
Ton lots	22.35	23.00	24.20
Less ton lots	23.35	24.00	25.20

## Chromium Metal

Contract prices, cents per lb, chromium contained, carload, f.o.b. shipping point, freight allowed, 97% min. Cr, 1% max. Fe.

	Eastern	Central	Western
0.20% max. C	83.50	85.00	86.25
0.50% max. C	79.50	81.00	82.25
9.00% min. C	79.50	81.00	82.25

## Calcium—Silicon

Contract price per lb of alloy, lump, f.o.b. shipping point, freight allowed.

	Eastern	Central	Western
30-35% Ca, 60-65% Si, 3.00% max. Fe or 28-32% Ca, 60-65% Si, 6.00% max. Fe.			
Carloads	14.00	14.50	16.55
Ton lots	16.10	16.85	19.00
Less ton lots	17.10	17.85	20.00

## Calcium—Manganese—Silicon

Contract prices, cents per lb of alloy, lump, f.o.b. shipping point, freight allowed.

	Eastern	Central	Western
16-20% Ca, 14-18% Mn, 53-59% Si.			
Carloads	15.50	16.00	18.05
Ton lots	17.60	18.45	20.20
Less ton lots	18.60	19.45	21.20

## Calcium Metal

Eastern zone contract prices, cents per pound of metal, f.o.b. shipping point, freight allowed. Add 1.5¢ for central zone; 3.5¢ for western zone.

	Cast	Turnings	Distilled
Ton lots	\$1.60	\$2.35	\$2.95
Less ton lots	1.95	2.70	3.75

## CMSZ

Contract price, cents per pound of alloy, f.o.b. shipping point, freight allowed.

	Eastern	Central	Western
Alloy 4: 45-49% Cr, 4-6% Mn, 18-21% Si, 1.25-1.75% Zr, 3.00-4.5% C.			
Alloy 5: 50-56% Cr, 4-6% Mn, 13.50-16.00% Si, 0.75 to 1.25% Zr, 3.50-5.00% C.			
Eastern Central Western			
Ton lots	16.00	17.10	19.05
Less ton lots	16.75	17.85	19.80

## SMZ

Contract price, cents per pound of alloy, f.o.b. shipping point, freight allowed.

	Eastern	Central	Western
60-65% Si, 5-7% Mn, 5-7% Zr, 20% Fe, ½ in. x 12 mesh.			
Ton lots	14.25	15.35	17.30
Less ton lots	15.00	16.10	18.05

## Other Ferroalloys

Ferrotungsten, standard, lump or ¼ x down, packed, f.o.b. plant Niagara Falls, Washington, Pa. York, Pa., per pound contained W, 5 ton lots, freight allowed... \$2.25

Ferrovanadium, 35-55%, contract basis, f.o.b. plant, freight allowances, per pound contained V. Openhearth \$2.70 Crucible \$2.80 High speed steel (Primos)... \$2.90

Vanadium pentoxide, 88-92% V<sub>2</sub>O<sub>5</sub> technical grade, contract basis, per pound contained V<sub>2</sub>O<sub>5</sub> \$1.10

Ferrocolumbium, 50-60%, contract basis, f.o.b. plant, freight allowed, per pound contained Cb \$2.50 Less ton lots \$2.55

Ferromolybdenum, 55-75%, f.o.b. Langeloth, Washington, Pa., per pound contained Mo. 95¢

Calcium molybdate, 40-45%, f.o.b. Langeloth, Washington, Pa., per pound contained Mo. 80¢

Molybdenum oxide briquets, 48-52% Mo, f.o.b. Langeloth, Pa., per pound contained Mo. 80¢

Molybdenum oxide, in cans, f.o.b. Langeloth and Washington, Pa., per pound contained Mo. 80¢

Ferrotitanium, 40-45%, 0.10% C max., f.o.b. Niagara Falls, N. Y. ton lots, per pound contained Ti \$1.23 Less ton lots \$1.25

Ferrotitanium, 20-25%, 0.10% C max., ton lots, per pound contained Ti \$1.35 Less ton lots \$1.40

High carbon ferrotitanium, 15-20%, 6-8% C, contract basis, f.o.b. Niagara Falls, freight allowed, carloads, per net ton... \$142.50

Ferrophosphorus, electrolytic, 23-26%, carlots, f.o.b. (Siglo) Tenn., \$3 unitage per gross ton \$65.00

Zirconium, 35-40%, contract basis, f.o.b. plant, freight allowed, per pound of alloy. Carload lots 17.00¢

Zirconium, 12-15%, contract basis, lump, f.o.b. plant, freight allowed, per pound of alloy Carload, bulk 5.50¢

Alsilfer, 20% Al, 40% Si, 40% Fe, contract basis, f.o.b. Niagara Falls, carload 6.25¢ Ton lots 6.75¢

Simanal, 20% Si, 20% Mn, 20% Al, contract basis, f.o.b. Philo, Ohio, freight allowed, per pound Car lots 9.00¢ Ton lots 9.75¢

**Boron Agents**

Contract prices per pound of alloy, f.o.b. shipping point, freight allowed.

Ferroboron, 17-50% min. B, 1.50% max. Si, 0.50% max. Al, 0.50% max. C.

Eastern Central Western	
Less ton lots	\$1.30 \$1.3075 \$1.329

Manganese — Boron 75.00% Mn, 15-20% B, 5% max. Fe, 1.50% max. Si, 3.00% max. C.

Ton lots	\$1.89 \$1.903 \$1.935
Less ton lots	2.01 2.023 2.044

Nickel—Boron 15-18% B, 1.00% max. Al, 1.50% max. Si, 0.50% max. C, 3.00% max. Fe, balance Ni.

Less ton lots	\$2.10 \$2.1125 \$2.1445
---------------	--------------------------

Silcaz, contract basis, f.o.b. plant freight allowed, per pound. Carload lots 35¢

Grainal, f.o.b. Bridgeville, Pa., freight allowed, 50 lb and over.

No. 1	87.5¢
No. 6	60¢
No. 79	45¢

Bortram, f.o.b. Niagara Falls

Ton lots, per pound	45¢
Less ton lots, per pound	50¢

Carbortam, f.o.b., Suspension Bridge, N. Y., freight allowed, Ti 15-17%, B 0.90-1.15%, Si 2.5-3.0% Al 1.0-2.0%.

Ton lots, per pound	8.0¢
---------------------	------



# Weekly Gallup Polls

(CONTINUED FROM PAGE 107)

The vote:

	Pct
Own business	68
Work for someone else	24
No opinion	8

The concept of "everyman his own boss" has particular appeal to the veterans of World War II. Today's survey finds that eight veterans out of every ten, or a much higher proportion than for the rest of the country, would prefer running their own business to working for someone else.

Manual workers as a group show less interest than others in branching out on their own. The differences by occupation groups follow:

	Own Busi- ness Pct	Some- one Else Pct	No Opin- ion Pct
Prof. & Bus.	81	14	5
Farmers	80	13	7
White Collar	63	30	7
Manual Workers	61	31	8

As to whether every man in the United States, besides owning his own business, has a chance to become a millionaire, there is quite a difference of opinion.

## New Press Operates

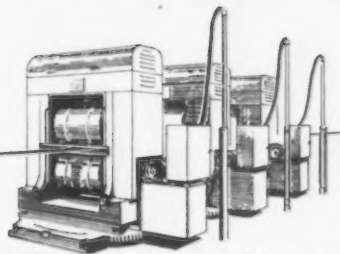
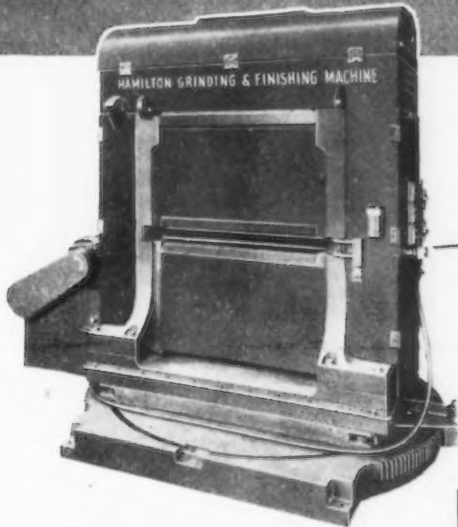
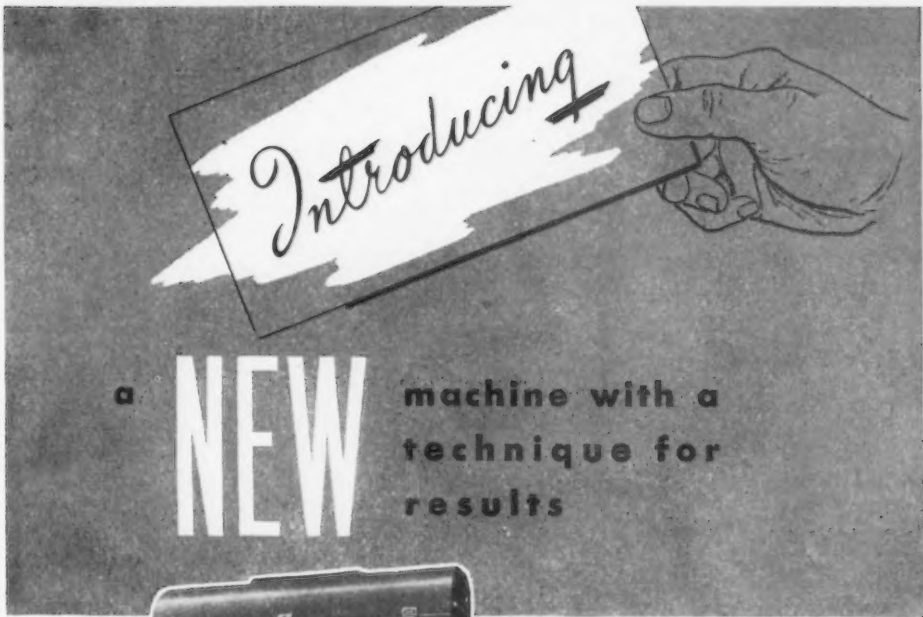
(CONTINUED FROM PAGE 59)

able the stock may be fed with utter disregard of the stroke cycle.

Standard practice of die clearance is entirely satisfactory for use on the Hypermatic, but greater clearances between punches and cut edges are both permissible and practical. This greater clearance provides a definite advantage in that there is less friction and wear and, therefore, it is logical that longer die life can be expected.

For die manufacture any standard die material can be employed. The machine will work well with dies of tool steel, alloys or carbides. The depth of cut multiplied by strokes per minute gives a figure well within the range of the cutting qualities of any good tool steel, even at press speeds of 2000 strokes per min.

Any force developed in the Hypermatic has its opposing similar force and these forces are absorbed by each other, rather than by the machine itself or by a heavy concrete foundation. The press has no provision for floor bolts and will stand indefinitely where placed.



## HAMILTON GRINDING AND FINISHING MACHINE

for grinding and polishing metal strip and sheets  
...all types and gauges...

### REVOLUTIONARY FEATURES

- Grinds both sides simultaneously
- Grinds in tandem sequence
- Grinds under water or soluble oil
- Grinds diagonally and with oscillation
- Grinds with controllable pneumatic resiliency

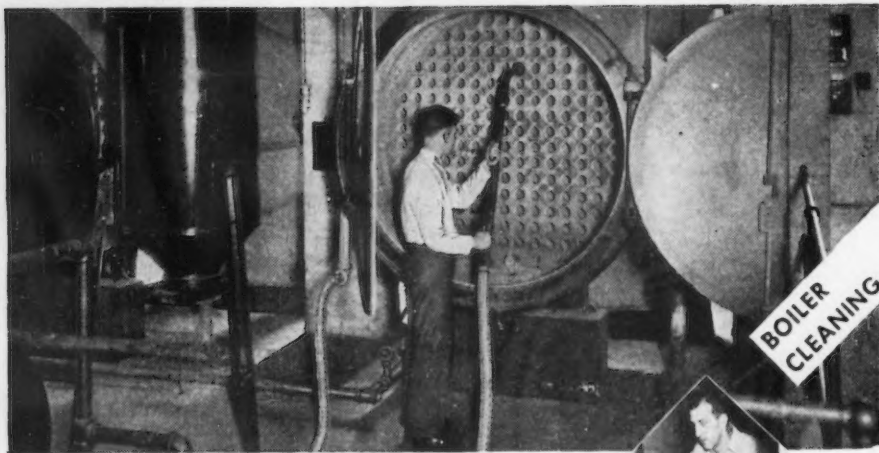
### REVOLUTIONARY RESULTS

- Faster production at less cost
- Superior finishes
- Healthier, dust-free conditions
- Continuous operations

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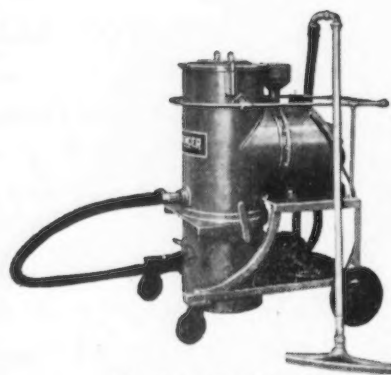
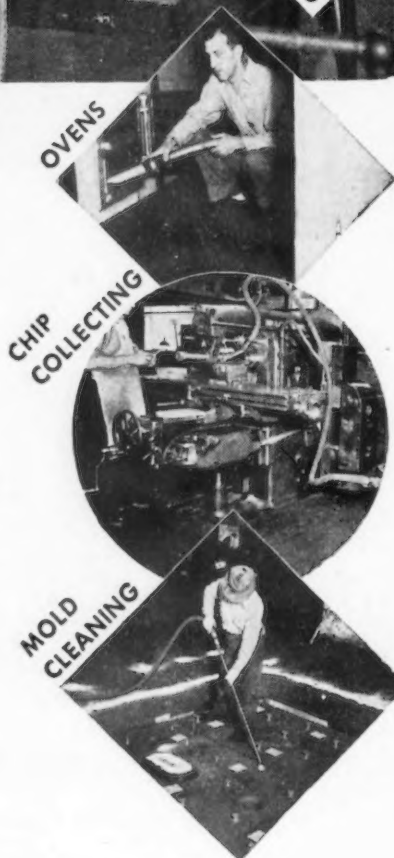


## Special USES FOR SPENCER VACUUM

In any plant, there are a dozen places where Spencer Vacuum could speed up and improve special operations, and at the same time reduce costs.

In the boiler room, soot is removed from tubes without blowing. Efficiencies are increased as much as 20%.

Cocoa shells and crumbs are removed from ovens in chocolate plants and bakeries. Chips are removed at the tool on delicate machining operations. Molds for castings weighing many tons are cleaned with a special Spencer vacuum tool. All this without blowing, without loss of time and with very low operating and maintenance costs. Ask for the Bulletins.



1 1/2 H.P. PORTABLE

### —FEATURE CONTINUATION—

One of the distinct features is the counterbalance in both upper and lower heads. These counterbalances automatically compensate for any change in length of stroke. Regardless of the stroke length, the counterbalance is always opposite to the throw so that the heads are in balance at all times.

The stroke of the press is adjustable. The adjustment is very simple and within the ability of any average mechanic. The arrangement is such that the stroke adjustment is made on all four cranks simultaneously.

Although there is practically no limit to the variety of work that may be performed on these presses, it is of interest to note that No. 10-24 hex machine screw units are being punched out at the rate of 1150 per min, and butterfly-type lock washers at the rate of 1700 per min. In the latter case as many as 450,000 washers have been produced without a regrind on the dies.

### High-Temperature X-Ray

(CONTINUED FROM PAGE 51)

specially designed furnace possesses several advantages over other high temperature X-ray powder diffraction cameras. Any number of patterns can be obtained at temperatures up to 2700°F without intermediate cooling of the sample under investigation. In addition, only 40 min are required for producing a complete diffraction pattern in a form ready for study.

The apparatus also offers a new approach to problems arising from differences in atomic, molecular, and crystalline structure of many materials. Further investigation is under way to determine changes in the crystal phases of refractory bodies occurring in use at temperatures up to about 2700°F. Other applications include studies of thermal expansion of powdered materials and of additions that will affect the rate of inversion of titania from the common form of anatase to the more useful rutile. Of particular importance in the ceramics industry, data may now be obtained directly on the crystalline changes taking place in raw materials during manufacturing processes.

**SPENCER VACUUM**  
HARTFORD  
**CLEANING**

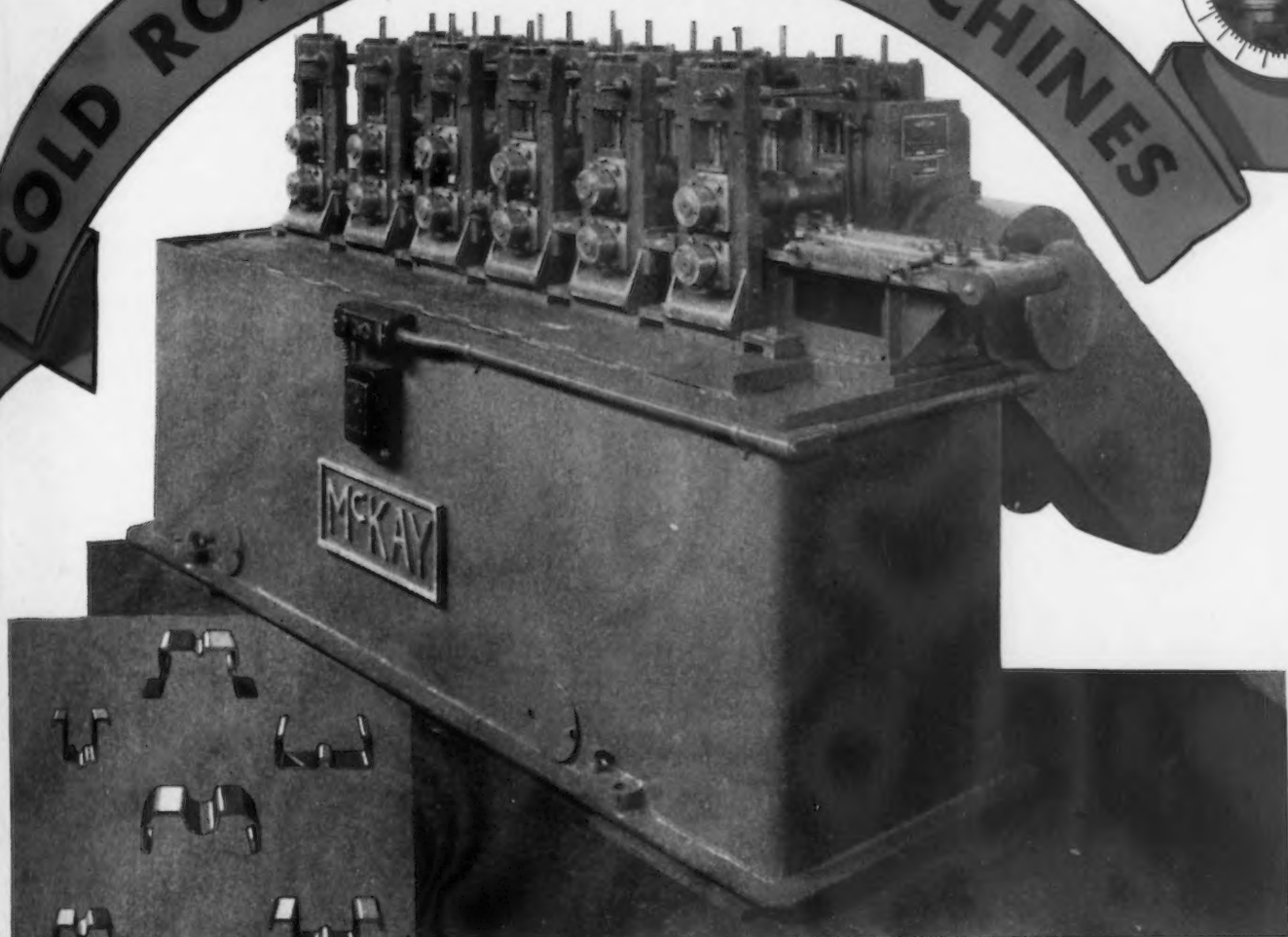
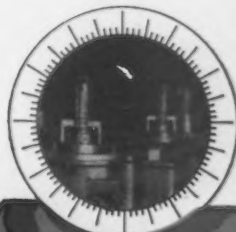
THE SPENCER TURBINE COMPANY, HARTFORD 6, CONN.



# McKAY

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## COLD ROLL FORMING MACHINES



Send your drawings or samples for quotations  
on equipment built to suit your needs.

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AND MANUFACTURERS OF  
TUBE MILLS**

**USING  
ELECTRIC RESISTANCE WELD  
OXY-ACETYLENE WELD  
ATOMIC HYDROGEN WELD**

- 1 **Micrometer Adjustment.** All pressure points on top shaft controlled by simple crank motion, through worm and gear reduction. Top shaft is always parallel. Micrometer dial furnishes visible check on roll pressures.
- 2 **Typical Rugged McKay Construction.** Standardized units, choice of gearing, anti-friction bearings throughout, all gears between bearings, not overhung.
- 3 **Interchangeable Guiding Equipment,** easily adjusted, quickly removable.
- 4 **Minimum Changeover Time.** All units engineered to allow complete roll change in shortest possible time.
- 5 **Low Maintenance Cost.** All of the above features, plus precision workmanship and up to the minute engineering are a guarantee of low maintenance.

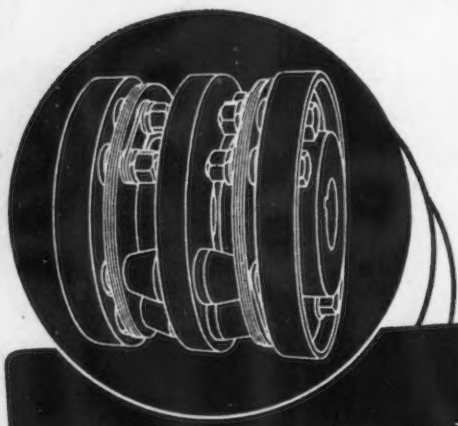


*The* **McKAY MACHINE** *Company*  
ENGINEERS AND MANUFACTURERS OF SHEET, TIN, AND STRIP MILL EQUIPMENT  
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# THOMAS

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are specified by engineers wherever  
100% dependability is demanded



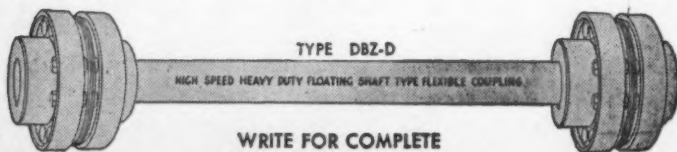
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provide for  
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**NO LUBRICATION IS REQUIRED!**

The Thomas All-Metal Coupling  
does not depend on springs, gears,  
rubber or grids to drive. All power  
is transmitted by direct pull.

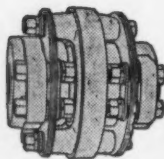


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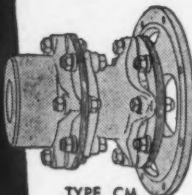
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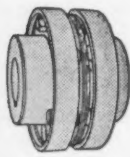
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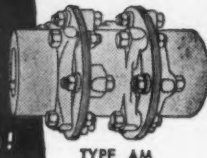
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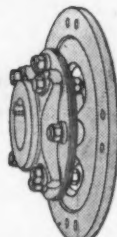
TYPE CM



TYPE ST



TYPE AM



TYPE SS

### NEWS OF INDUSTRY

#### Tells ASME Members Coal Reserves in U. S. Can Last 1500 Years

Chicago

... Coal reserves in this country are so enormous that they can supply all U. S. requirements for the next 1500 years, Dr. Harold J. Rose, vice-president and director of research for Bituminous Coal Research, Inc., Pittsburgh, told the American Society of Mechanical Engineers here recently at the fuels luncheon of its semi-annual meeting. This applies to requirements for heat, light, power, transportation and the smelting of metals, all liquid and gaseous fuels, and most synthetic chemicals, at the present rate of consumption with allowance for conversion efficiencies, he said.

"The world has spent more of its mineral wealth in the last 40 years than in all preceding history," the speaker stated. "Production has been particularly great in the United States, so that we already are a 'have-not' nation, or are rapidly becoming one, with respect to many important minerals."

The outstanding bright spot in this serious situation, he said, is the enormous coal supply, amounting to about one half the world's known reserves.

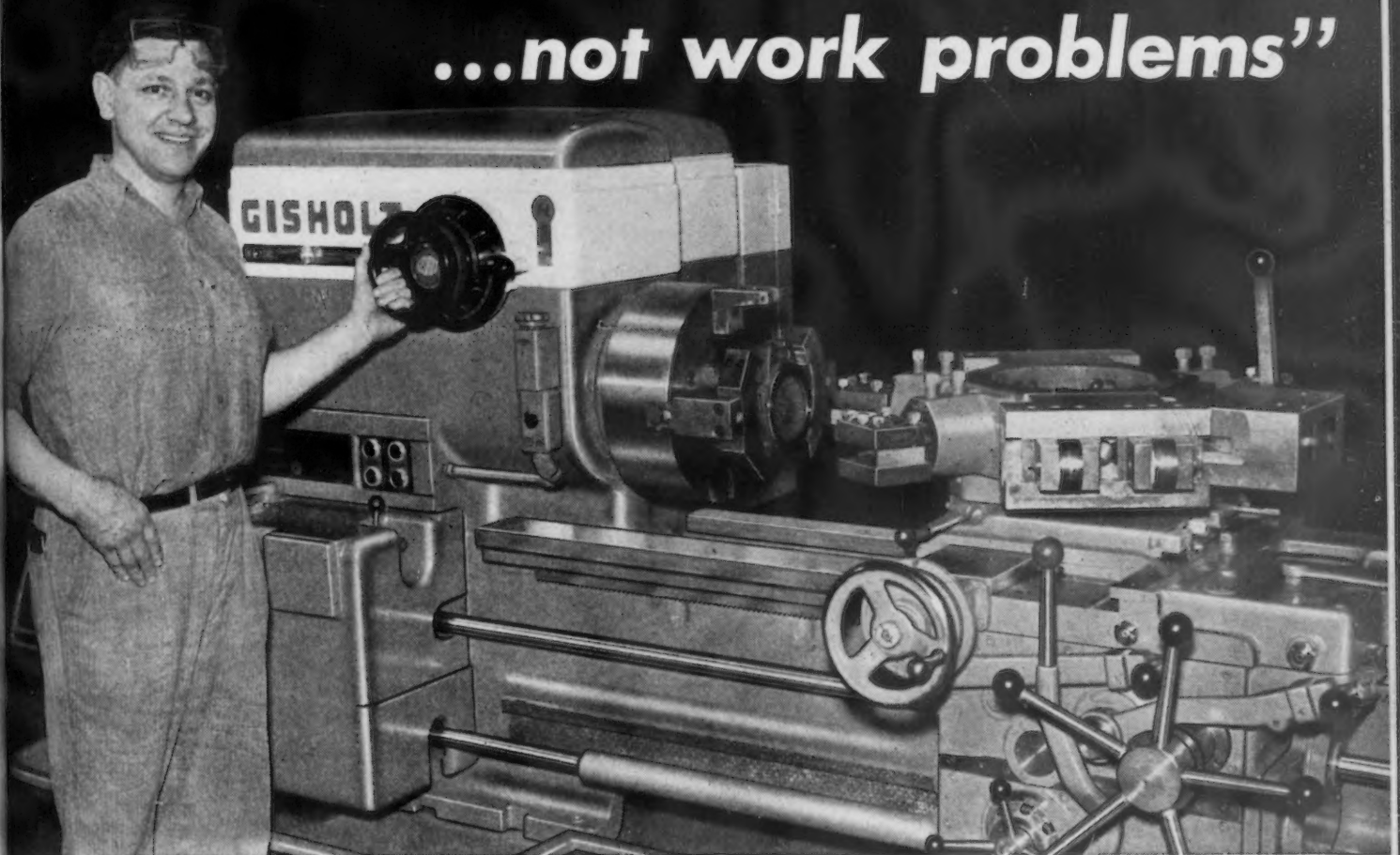
"Coal has been, and will continue to be, this country's most important mineral resource, and the foundation of its expanding industrial production. Technical developments have been so rapid that coal can now be used to produce almost any type of solid, liquid or gaseous fuel or synthetic chemical product."

In contrast to the large coal reserves, Dr. Rose continued, the proved U. S. reserves of petroleum and natural gas would last only 8½ years if they could be produced and used fast enough to supply their present markets, and to take over all present coal uses at the same Btu efficiency.

These facts are causing a great increase in the support being given to coal research, he pointed out, by the coal industry itself, by federal and state governments, by the petroleum, gas and chemical industries and by equipment manufacturers. Expenditures on research and engineering development work closely related to coal



**"I like to PRODUCE  
...not work problems"**



## the GISHOLT Speed Selector does the figuring!

No wonder turret lathe operators like the Gisholt Speed Selector. Without it, here is what they have to do to get the proper spindle speed:

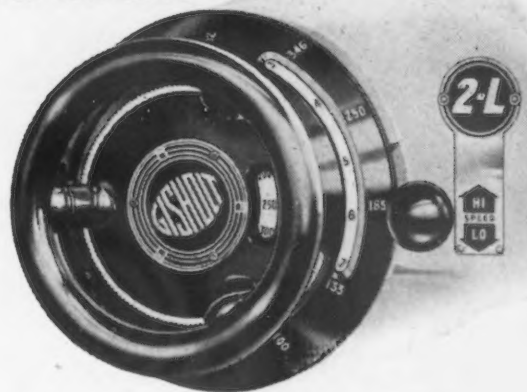
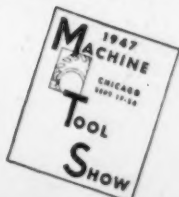
1. Take the diameter to be cut and multiply it by 3.1416 to get the circumference.
2. Refer to tables to get the proper cutting speed in feet per minute for the material, based upon depth of cut, tooling and feed.
3. Divide cutting speed by circumference at cutting point to figure the proper spindle r.p.m.
4. Get the spindle revolving at that speed by means of manual control.

All this the Gisholt Speed Selector eliminates. The operator merely turns the hand wheel to the diameter of the cut. The machine automatically responds with the proper spindle speed.

Nobody wants to do it the hard way any more. That's why the Speed Selector is now standard equipment on Gisholt Turret Lathes.

**GISHOLT MACHINE COMPANY**  
Madison 3, Wisconsin

Be sure to see all the new  
advancements in the big Gisholt exhibit  
at the Machine Tool Show



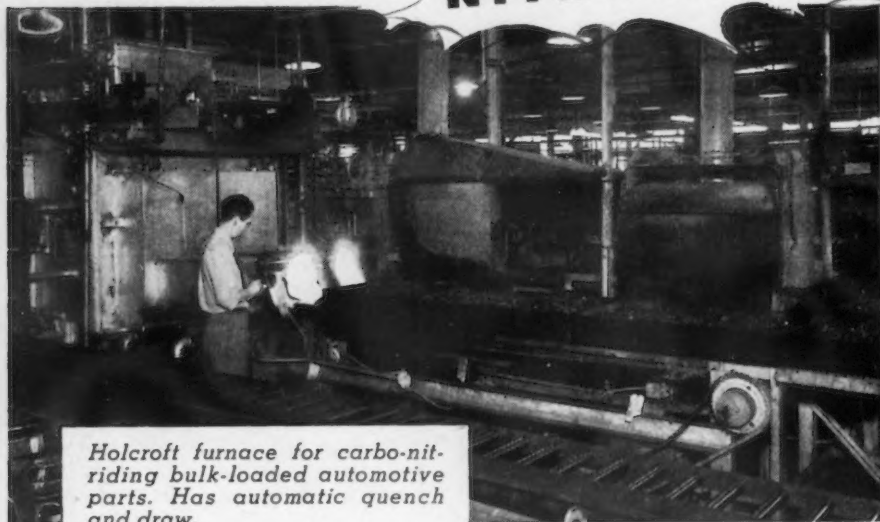
THE HYDRAULIC SPEED SELECTOR, now standard on Gisholt Turret Lathes, is another important improvement in the interests of greater production and lower machining costs. Ask for complete information.



THE GISHOLT ROUND TABLE represents the collective experience of specialists in the machining, surface-finishing and balancing of round and semi-round parts. Your problems are welcomed here.

TURRET LATHES • AUTOMATIC LATHES • SUPERFINISHERS • BALANCERS • SPECIAL MACHINES

# BLAZING THE HEAT TREAT TRAIL . . . CARBO-NITRIDING



Holcroft furnace for carbo-nitriding bulk-loaded automotive parts. Has automatic quench and draw.

## A SUPERIOR CASE-HARDENING PROCESS

Developed by

*Holcroft*

CARBO-NITRIDING provides a "gas cyanided" case by heating the work in a controlled atmosphere composed of generator gas, hydrocarbon gas and ammonia. This Holcroft process uses continuous-type furnaces such as the unit shown above, and offers these advantages:

- 1 Low operating cost—often as low as one-fourth that of liquid cyaniding.
- 2 Superior wear resistance—greater than with carburizing.
- 3 Greater depth of hardenable case obtained per unit of time than by carburizing at the same temperature.
- 4 Minimum distortion through low-temperature operation and slow cooling when required.
- 5 Applicable to both plain carbon and alloy steels.

Although the theory behind carbo-nitriding is mentioned in a patent issued in 1883, it was not applied to high-production furnaces until rediscovered independently by Holcroft & Company in 1936. The first furnaces of this type, built 11 years ago, are still in operation; and many other production furnaces installed since then have further proven the merits of this process.

*The Holcroft engineering leadership which developed carbo-nitriding is available to serve you—offering the advanced features and specialized design which assure better results at lower cost in heat treat work of every kind. We invite your inquiries.*

PRODUCTION HEAT TREAT FURNACES FOR EVERY PURPOSE

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5724 Navigation Blvd.

Canada: Walker Metal Products, Ltd., Walkerville, Ontario

## NEWS OF INDUSTRY

are \$15 million or more annually, in this country, with large additional expenditures in England and other countries.

In conclusion, Dr. Rose summarized the broad trends and objectives of research to meet the increasing demands that will be made on coal, to maintain U. S. industrial supremacy and the high standard of living.

## Good Results Claimed After \$100,000 Test Of Freight Car Shock

Monroe, Mich.

• • • Successful completion of a \$100,000 test of ride control equipment for railroad freight cars, designed to drastically reduce the "triple damage" of lading losses, car repairs and roadbed maintenance, was announced by Brouwer D. McIntyre, president of the Monroe Auto Equipment Co.

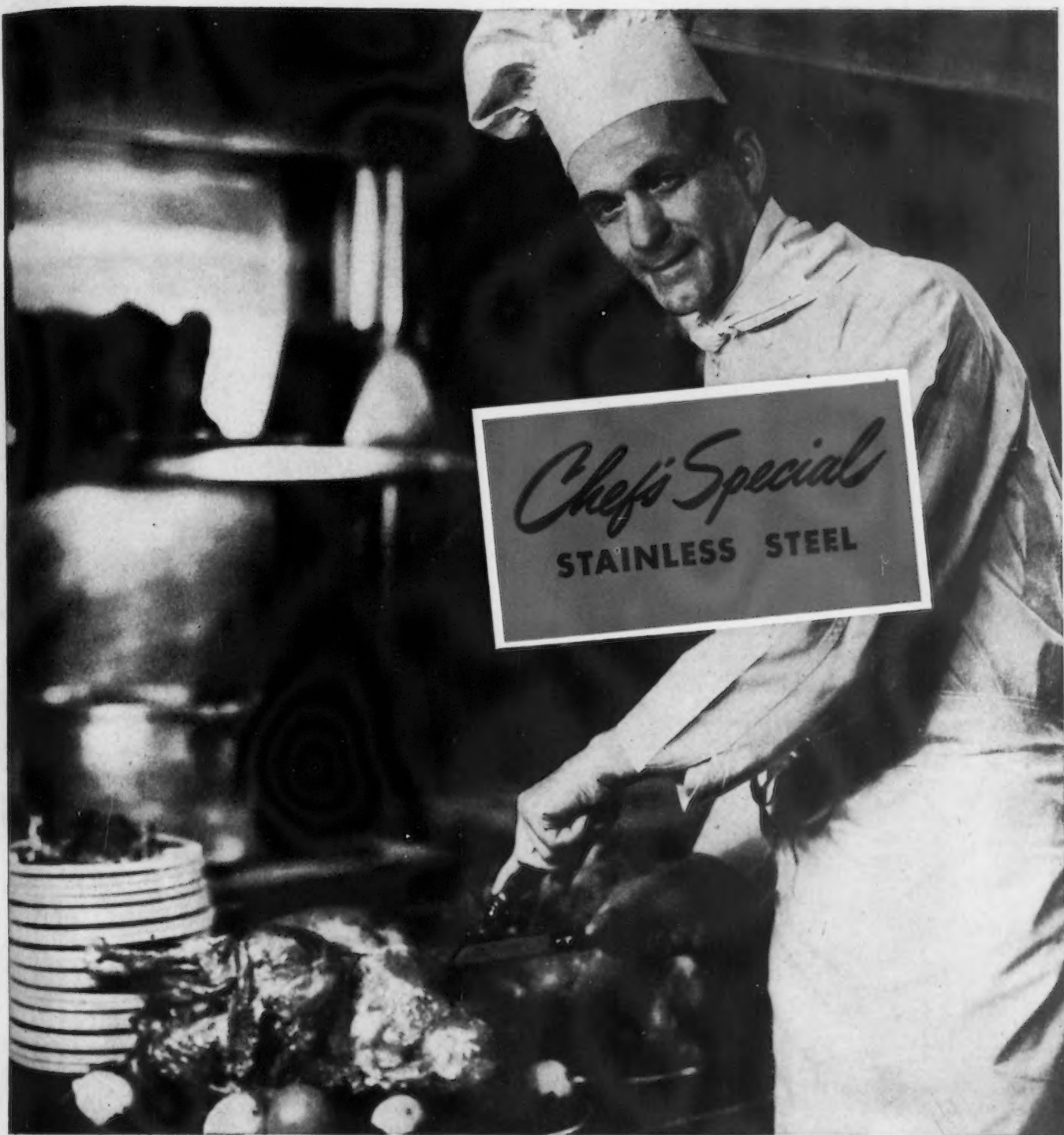
The reduction is effected through cutting down shock and vibration—principal "triple damage" causes—by as much as 93 pct through the use of direct-action hydraulic shock absorbers similar to those on new railroad passenger cars and automobiles, according to the company.

Adaptations and installations for all freight cars now in service and all new freight cars now being built were developed during the test. Extending over 10 months and covering trials on two railroads as well as plant and laboratory experiments in which operating conditions were simulated by a mechanical oscillator in loaded and empty freight cars, the test involved scientific recordings of 75,000 occurrences of shock and 17,000 other ride phenomena, 5200 ft of ride recorder data and 1580 oscillograms.

The test was conducted by Waugh Laboratories, New York, with the cooperation of the Monroe engineering staff, North American Car Corp., Merchants Despatch Transportation Corp., Tobin Packing Co., Pere Marquette R.R., and Chicago, Rock Island and Pacific R.R. N. H. Roy, formerly of the University of Illinois and director of Waugh Laboratories, was in charge.

Thirty-five test conclusions, certified by Waugh to Monroe, covered freight cars with and without





*Chef's Special*  
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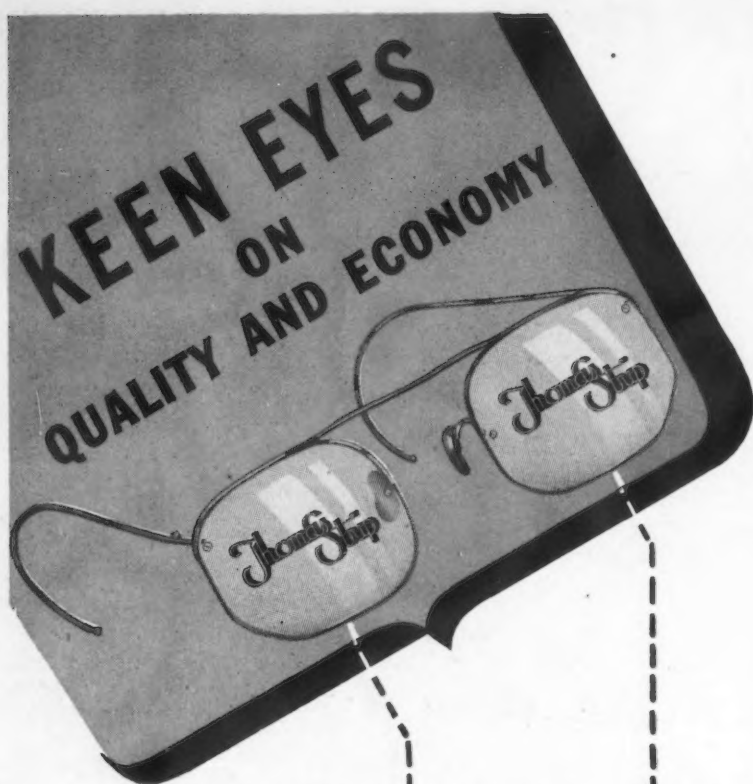
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## NEWS OF INDUSTRY

Monroe hydraulic shock absorbers and with various types of springs. The conclusions analyzed ride control performance in refrigerator cars in meat service between Estherville, Iowa, and Chicago, a distance of 465 miles, and in refrigerator cars in the Monroe plant where 80-lb and 110-lb sand bags were used to simulate meat on the hooks and the oscillators were used to approximate conditions of shock and vibration at speeds up to 90 mph.

Analyzing the conclusions, the laboratory reported substantial reduction in vertical and lateral shock. It is held that such equipment installed in freight cars could not only reduce damage to goods in transit but reduce wear on cars and roadbeds and permit higher freight train speeds.

## British Executive Regrets American Market Influence

London

... Criticizing the retention of control over the non-ferrous metals at the recent annual meeting of the Amalgamated Metal Corp., Walter Gardner, the chairman, said it was deterrent and frustrating to business. The rise in values since 1946 was not a healthy sign, for increasing production was slow in materializing.

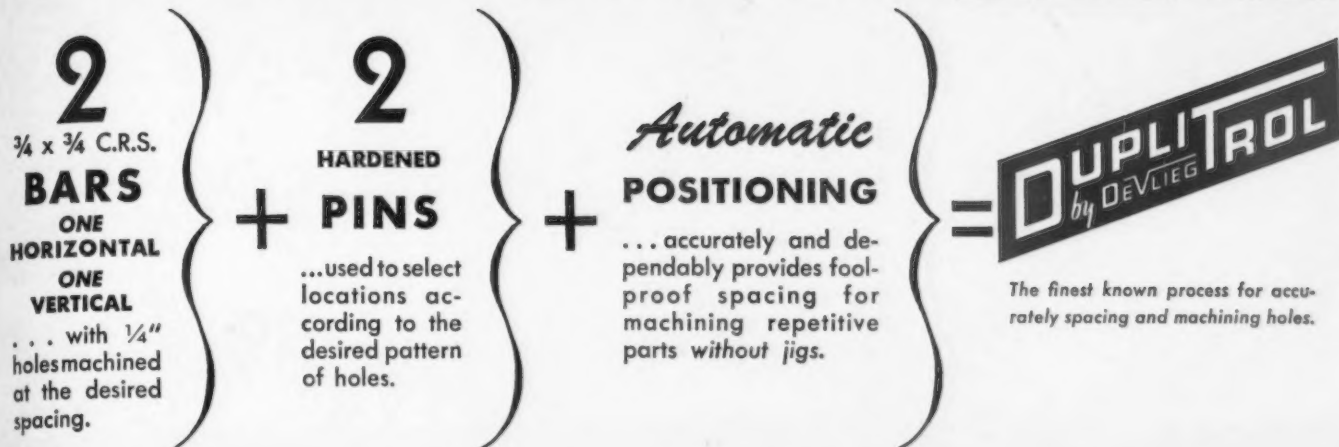
Pointing out that the U. S. A. had become an importer of metals, Mr. Gardner said that, ready to pay high prices in order to satisfy its domestic demand, America was making other countries, who had not the same financial resources available, experience great difficulties in satisfying their minimum needs. He could not foresee any change in the situation at present.

Entering a plea for the reopening of the London Metal Exchange, Gardner said: "I don't believe that Great Britain's role in gaining her livelihood can in the future, any more than it has done in the past, be solely of an industrial character. Commerce has always played a large part in her economy and must do so again. ... There is a great mass of technical and eager commercial skill available in the City of London which is being wasted by the country at the present time."



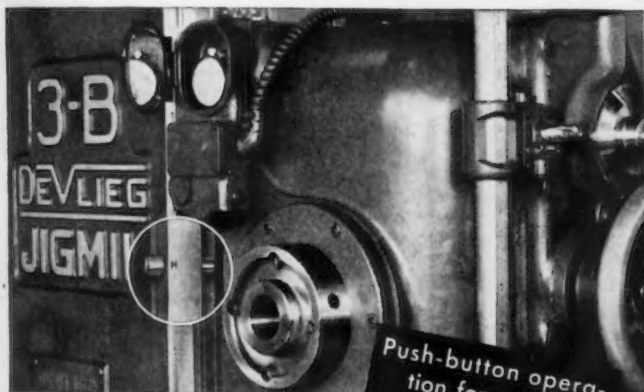
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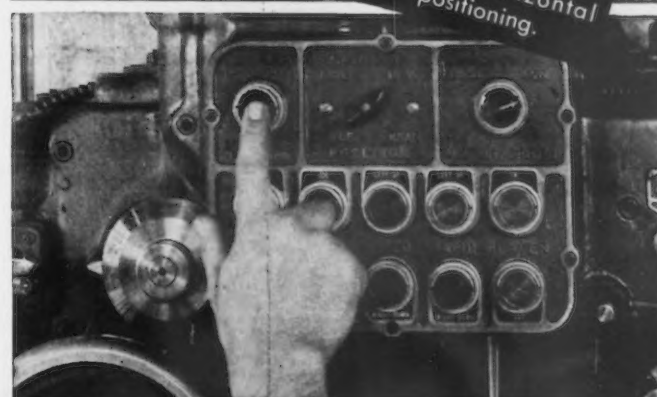
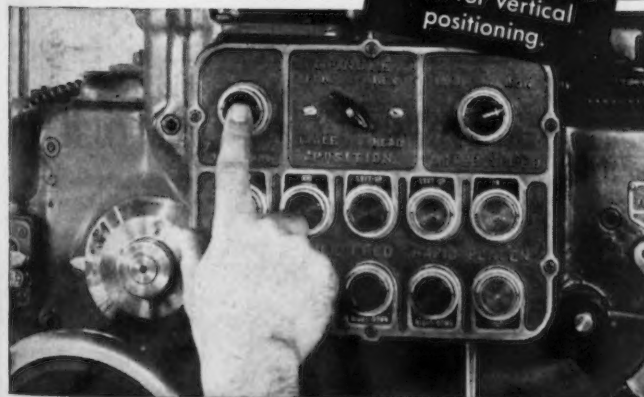
Illustrated at right is one vertical bar and one horizontal bar with pins used as masters on the 3B DeVlieg Duplitrol Equipped Jigmil. Below are illustrations showing how all spacing is done in response to push-button operation.



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136—THE IRON AGE, July 10, 1947

## NEWS OF INDUSTRY

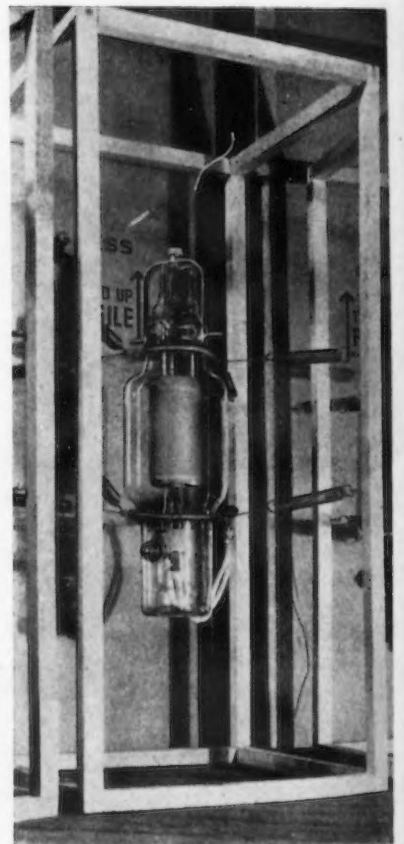
### Sees Record Canadian Production of Heating, Plumbing Equipment

Ottawa

• • • Production of plumbing and heating equipment and supplies in Canada will reach the greatest record in history, according to a report by the Canadian Institute of Plumbing & Heating. The industry is doing its utmost to provide the necessary heating and sanitary plumbing equipment for the new homes and industrial buildings now being erected under the vast construction program, the report says. Barring unforeseen stoppages, the industry should turn out almost double the 1939 production.

Extent of the increase in industrial production is indicated by figures released by the Dominion Bureau of Statistics, which indicate that about 72,000 furnaces will be made in Canada this year. This is 80 pct over the 1939 total and 47 pct in excess of the prewar

**INDIVIDUAL SPRING SUSPENSION:** To eliminate losses in shipping due to breakage, the Amperex Electronic Corp., Brooklyn, is using this suspension method. The wooden frames fit snugly into corrugated cartons.





peak. Last year some 60,000 furnaces were made in Canada.

An average increase of 66 pct over the prewar record is expected in a wide range of plumbing and heating equipment, including radiators, hot water storage tanks, furnaces, cast iron pipe fittings, steel pipe and fittings, and electric water heaters. Bathtubs, sinks and wash basins, also are expected to show a similar increase.

The largest increase over prewar production is expected in electric water heaters of which 67,000 units are expected, three times the 1939 rate. Other large gains are expected in cast iron radiators with production estimated to total 8.5 million sq ft, which will be 70 pct above the prewar peak made in 1937, and in hot water tanks of which 155,000 are planned, a gain of 60 pct over the record made in 1939.

### Poland, Czechoslovakia Map Cooperation Plan

London

... Poland and Czechoslovakia are to cooperate, not compete, in economic and certain industrial fields, according to a statement by M. Jan Masaryk, Czechoslovak Foreign Minister. He said that Poland's economic structure had changed as a result of the recovery of territory. Once her industry was built up, she would be in a position to supply Czechoslovakia with raw materials and industrial products as well as coal.

Czechoslovakia would assist in the reconstruction of Polish industry, the long-term policy being to cooperate industrially and avoid overlapping in the home and export markets, each country supplementing the other. The two countries would also cooperate technically, exchanging drawings and other information.

The Polish 3-year Plan envisages a big increase of production at Poland's rolling-stock plant at Wroclaw (formerly Breslau), the largest in the country. In 1936 this plant produced 2840 coal cars and three passenger cars. In 1949 it is expected to turn out 9600 coal cars, 300 tenders and 300 passenger cars, according to the Polish Embassy in London.

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*Airco Technical Representative*

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## NEWS OF INDUSTRY

### Engineering Problems Delay Use of Atomic Production of Power

Chicago

•••The use of atomic energy for practical power production devolves upon the solution of many engineering problems which must be solved by the engineer and the nuclear physicist, working together, speakers told the American Society of Mechanical Engineers at its semi-annual meeting here recently. Dr. Alfred O. C. Nier, professor of physics at the University of Minnesota, and in 1940 the first scientist to separate uranium 235, addressed a session devoted to atomic power engineering on "Some Nuclear Problems." Bruce R. Prentice, of the engineering policy division of General Electric Co., Schenectady, discussed "Some Design Problems." Mr. Prentice is assistant to Harry A. Winne, GE vice-president, in coordinating engineering activities in the field of nuclear power projects.

In a general statement of the problem, Dr. Nier pointed out that the construction of atomic reactors requires materials whose properties are largely unknown under the operating conditions. New materials will have to be developed so that the greatest efficiency of operation will be achieved. In all of this work the engineer will have to take account of the nuclear properties of materials as well as properties already known.

Among the problems enumerated by Dr. Nier is that of the heavy shield that must be provided against the death dealing emanations from the atomic power plant. It has been shown that if 1 lb of uranium, an amount about the size of a golf ball, undergoes fission, energy in an amount roughly equivalent to 200,000 gal of gasoline will be released, or enough for the average motorist to run his car 200 years.

"Unfortunately there is a hitch in all this," he continued. "It has been estimated that in order for it to be safe for a human being to be near an atomic reactor, at least 50 tons of shielding material are required—an amount somewhat more than an automobile can stand!"

"While this rules out small mobile installations, such a weight of shielding would not be particularly detrimental in stationary units or



in large propulsion units, such as might be used on ships."

A second problem has to do with the removal of waste products from any practical atomic "furnace." When an atomic fuel undergoes fission, elements near the middle of the atomic table are formed. For each atom of U-235 which is destroyed, two new lighter atoms are created. Some of these will have a low "cross section" for absorption of neutrons. Others will have larger values and will act as parasites in removing neutrons from the pile. In the Hanford plant, the problem was solved by removing the canned uranium slugs at regular intervals, dissolving the contents by a laborious chemical process, and separating the uranium and plutonium for further work.

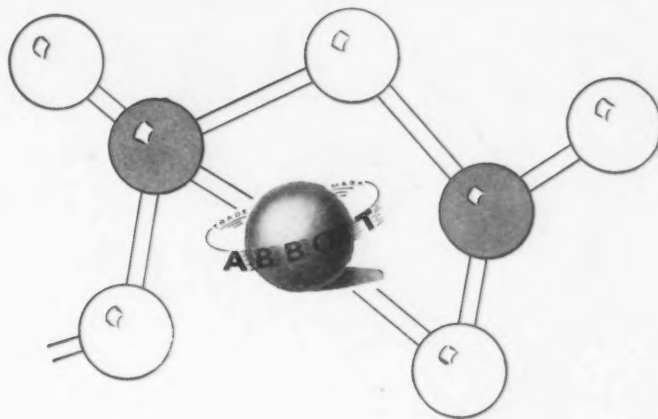
The speaker stated: "This might be a fairly straight forward operation, were it not for the fact that the fission products are so strongly radioactive that all chemical manipulation has to be done in batch processes by remote control behind thick concrete shields. The replacement of the batch handling by continuous methods should be a challenging problem to the engineer and would do much to lower the cost of atomic energy."

One of the problems is that of the choice of the "moderator," that is the medium by which the fast neutrons produced in the fission process are slowed down in order to set up the chain reaction. Dr. Nier listed hydrogen, helium, lithium, beryllium, boron and carbon. The substance must slow

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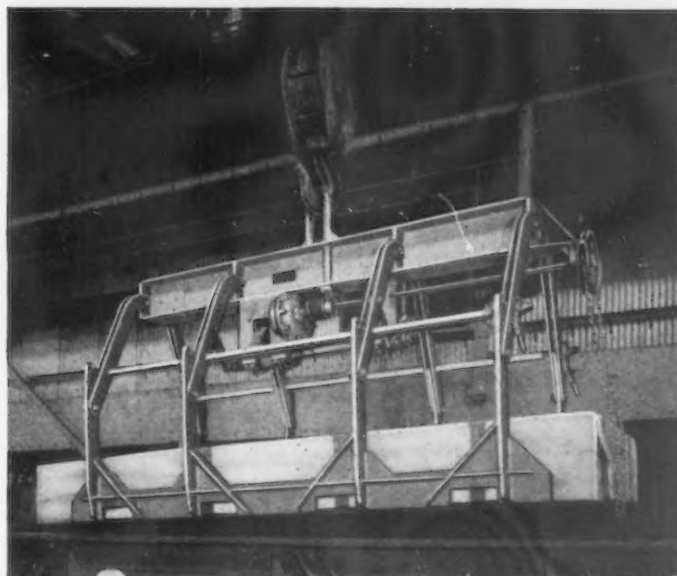
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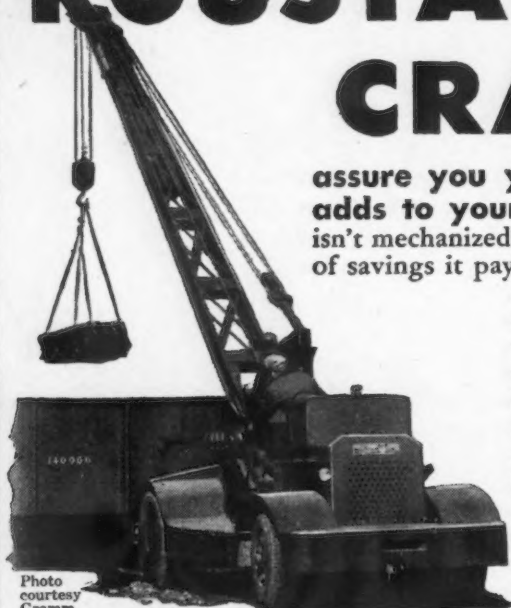


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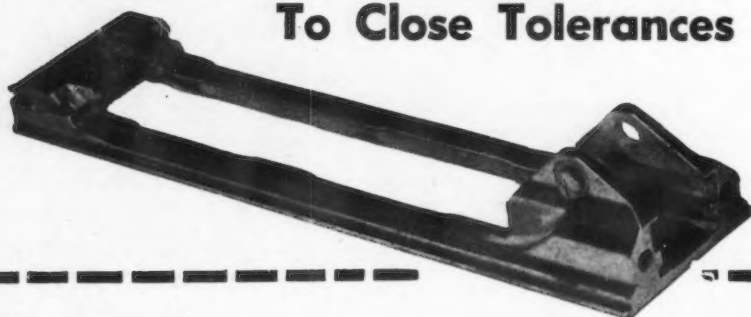
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down the neutrons in as few collisions as possible, since thus the chance of losing neutrons will be reduced. Besides this slowing-down ability, however, it must not lose too many neutrons by a process of absorption. Since the mass of the hydrogen atom is the same as that of the neutron, it possesses the slowing-down characteristic, but its property of absorption is too great.

Helium would be an excellent material to use, but since it is a gas it would be hard to obtain a high density of atoms without the use of very high pressures. Lithium and boron, because they absorb neutrons so readily, are poor substances for slowing-down media. Beryllium and carbon are good. The latter, because of its availability in the form of graphite, actually is used in the chain reacting piles now operating.

The need for extremely pure material was stressed. If carbon, for instance, is used as a moderator, and if it contains only ten parts per million of boron as an impurity, as many neutrons will be absorbed by the boron as by the carbon itself.

Besides uranium-235 and other fissionable elements, Dr. Nier pointed out that some elements not now practicable may eventually be used in atomic reactors. Cadmium, for instance, has long been known as one of the best absorbers of slow neutrons.

"Cadmium is known to consist of eight different kinds of atoms, ranging in mass from 106 to 116 times the mass of hydrogen. Recently it was shown that the abnormally high neutron absorption cross section could be attributed entirely to one type of cadmium atom, the isotope of mass 113, which has an abundance of only 12 pct. In spite of the fact that cadmium is a very good neutron absorber, we would have one of eight times the absorbing power if this particular isotope could be isolated in quantity.

"Perhaps we shall some time see the day when separated isotopes of any element will be available at reasonable cost. If this ever happens, it will mean having additional building materials for atomic reactors at our disposal, for we then may utilize elements not now acceptable because one or more of their isotopes may have objectionable properties. At the present time





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the separation of isotopes is so difficult and expensive that only in the case of uranium does it pay to carry out the separation."

In summation Dr. Nier said: "The problem of producing atomic energy is largely one of making efficient use of neutrons. This and the concept of atomic fission are really the only basically new factors with which the engineer must contend. Otherwise the problem of producing atomic energy involves merely modifications of problems which engineers have already solved or will solve in connection with other work.

### Light Plate Shortage Upsets Shipbuilding Program in England

London

... Shipbuilding is outside the six priority consuming classes for British steel and members of Parliament for shipbuilding areas have added to the complaints of shipyard employers and workmen thereat. Mr. John Wilmot, the Minister of Supply, however, is adamant on the point. He will not give any priority to shipbuilding.

The government was shocked, and somewhat shaken, by the widespread effect of the fuel crisis last winter, and Mr. Wilmot reiterated in the House of Commons on June 17 that priorities must be confined to programs directly contributing to the expansion of fuel and power resources. Unfortunately, all these industries conflict with shipyard needs for light plates. The government is bound to feel pressure from the shipbuilding centers, where keen disappointment is expressed at Mr. Wilmot's statement. The government's "Economic Survey" laid down a target of 1,250,000 long tons of new ships to be completed annually. The completion rate is now said to be 800,000 tons.

Shortage of steel is creating unemployment among shipyard workers. Sir James Lithgow, leading Scottish shipbuilder, has asserted that unless more steel is made available to Clydeside, 18,000 men will have to be paid off. Already over 3000 men are idle in Greenock, representing 10 pct of the insured population of that town.

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## Government Deciding Sites for Welsh Mills To Settle Discussion

London

...The plan for modernizing the South Wales steel-sheet and tinplate trade includes the provision of two cold-reduction mills, one for tinplate and the other for sheets. Their siting has been a matter of doubt and no little controversy, Welsh local authorities, the workmen at existing establishments and the Steel Company of Wales having each their own views. The decision has rested with the government, which is concerned with the distribution of labor in Wales and other areas which were troubled by unemployment before the war.

The government's decision in regard to the cold-reduction plant for tinplate is that it should be placed at Trostre, near Llanelli. The location of the cold-reduction plant for sheet-steel has not yet been decided.

The location of the cold reduction plant for tinplate has had to

be decided, states the Ministry of Supply, in the light of the fact that the reorganization of the tinplate industry will, as the new plants come into operation, create a surplus of labor in the trade. It will therefore be necessary to arrange for other industries to be provided within the tinplate area capable of employing the extra manpower. The socialist government has considered how best to locate the cold reduction plant for tinplate in order to provide the best arrangement and location for the other industries that will be required. After weighing all the social and technical factors involved, they have concluded that Trostre, near Llanelli, is the most suitable place at which to erect the plant, and that new heavy industries to employ the redundant man-power should be located in or near Swansea. They regard it as an essential part of the scheme that proper opportunities of employment should be provided for those men who will lose their jobs owing to the construction of the new plants.

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